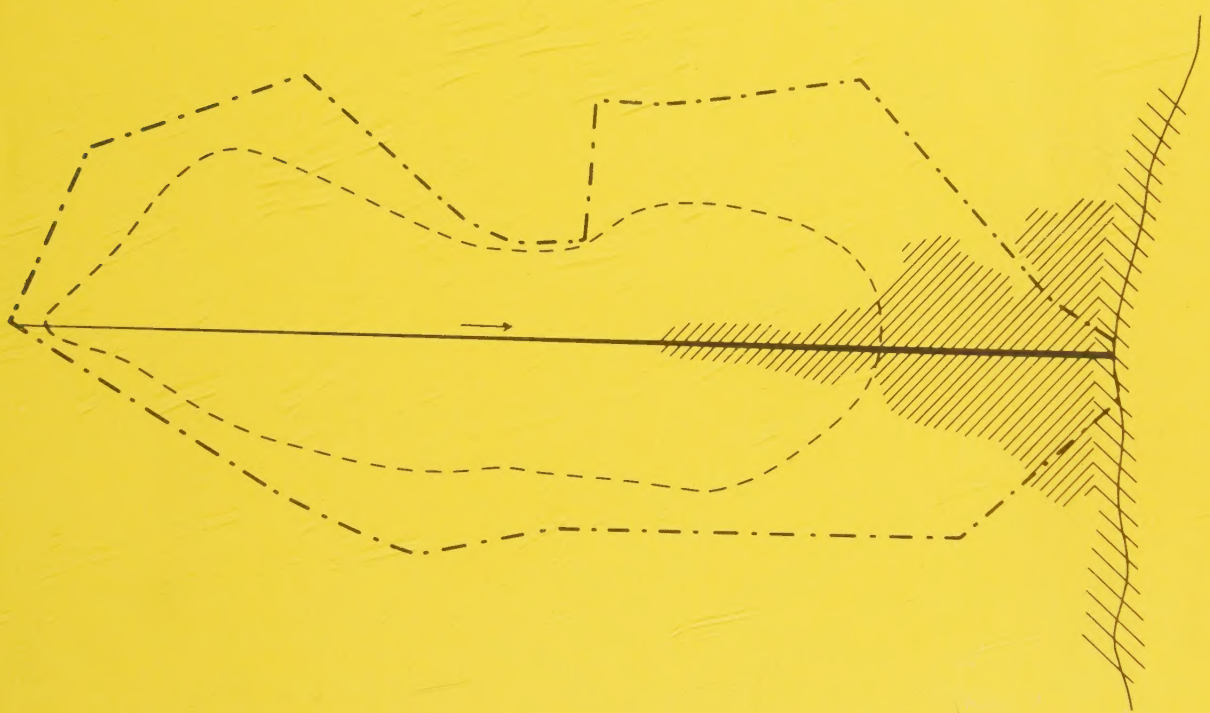
THESES AND PAPERS IN NORTH–EUROPEAN ARCHAEOLOGY 8

AGRARIAN SETTLEMENTS AND HUNTING GROUNDS

A Study of the Prehistoric Culture Systems in a North Swedish River Valley



Klas-Göran Selinge

Stockholm 1979

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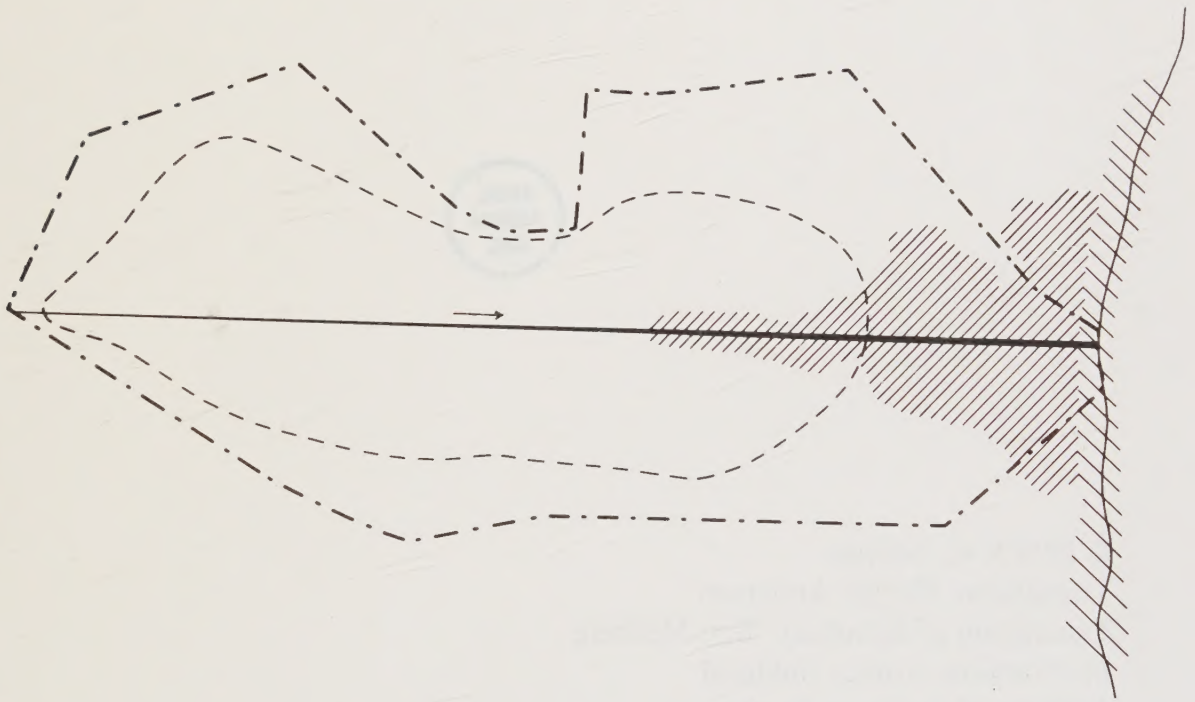

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To
SARA-LIS
and
KARIN

I think there is a great deal of truth in Leach's view that as soon as archaeologists use 'How' and 'Why' questions, they speculate. *But again: this does not mean we should not try!* . . . we should never allow ourselves to be discouraged by any preapprehended demonstration that our goals are inattainable. Instead, our task is to try to get clearer ideas of how far and within what limits it can be done.

Carl-Axel Moberg

ABSTRACT

This thesis is based upon the author's earlier work within the archaeology of Middle Norrland, Sweden, partially as director of field survey work, commissioned by the Central Board of National Antiquities and partially as co-operator in *Västernorrlands förhistoria* (the Prehistory of the county of Västernorrland), where the cultural and settlemental development of the agrarian prehistory of the county was handled. The main purpose of the thesis is to investigate the prerequisites for this agrarian culture in the earlier prehistory of the county – that is to say in the hunting and gathering culture of the Stone and Bronze Ages – and to try to design a total view of the Prehistory and early History of the area on a general level. As a model area the Ljungan river basin is used for this purpose.

In Section 1 the methods and results of the previous investigation of the agrarian culture is briefly summarized, and in Section 2 a survey of the natural prerequisites for human culture in the river basin is delivered. Section 3 deals with some actualized research methods, according to an analysis of the soruces and in association with systems theory. A research design in a three stage model, connecting the source groups and the ancient monuments' environments, is presented.

Section 4 treats the subsistence model for the hunting culture in the inland area and for a difficultly defined coastal environment and gives references for the agrarian culture. In Section 5 the social models for the same units are investigated, and it is concluded that the inland and the coastal areas probably are parts of one mobile culture system, while the agrarian culture has a clear sedentary character.

In the last section an attempt is made to explain the cultural development in the whole area as a cultural process. Two alternative explanative models are discussed, and in principle an adaptive, innovatory model is considered most relevant to explain the cultural history as one integrated process from the Mesolithic times and up to the Middle Ages. The involved ethnical complications are also briefly indicated.

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PREFACE

This thesis is to be considered as a by-product of my activity on duty at the Department for the Survey of Ancient Monuments at the Central Board of National Antiquities, Stockholm. During eleven seasons in the period of 1964-1976 I was in charge of the most considerable part of the department's field work in Middle Norrland, above all in the provinces of Jämtland and Medelpad but also in parts of Härjedalen, Hälsingland, Ångermanland and the south of Lapland. In this way I had the advantage of recording numerous remains of different kinds from all prehistoric periods and from the Middle Ages and to study their different environments and the cultural landscape in an empirical way. These experiences are the most fundamental basis for this study. Another point of origin is the current research situation with several new, among others theoretical, tendencies in archaeology, some of which have been felt essential and inspiring even at more casual studies. A result of these situations is a gradually growing confidence - sound or not - that the quantitatively accentuated material of the Register of Ancient Monuments is well adapted for some of the new attitudes, not at least for regional studies.

A first preliminary reworking - concerning the ancient monuments and their environment in Medelpad - was presented as a licentiate thesis with settlement archaeological aims in 1969. A brief summary of this with some current additions on the new material from Jämtland was presented in 1970 and published 1973. I was, thereafter, upon commission by the County Council of Västernorrland given an opportunity to treat the Iron Age of Medelpad and Ångermanland somewhat more thoroughly but still in a general way and with settlement archaeological aims. This study was finished in the autumn 1975 and published two years later in *Västernorrlands förhistoria* (the Prehistory of Västernorrland). It is very briefly summarized in the first section of this book but also available in Swedish in its entirety. In 1976 I also wrote a brief, more popular survey on the registered material from the county of Jämtland (i.e. the provinces of Jämtland and Härjedalen), published by the County Museum and aimed at a similar cultural-ecological way.

At that time an attempt to a more general treatment of the prehistory of the whole area with somewhat changed viewpoints, conditioned by the new archaeological courses, was felt as a temptation. After some selected reading during 1977, this work has, therefore, essentially been written interruptedly during 1978. My Swedish manuscript was finished in February 1979. Only in exceptional cases has literature, published later than 1977, been regarded. Of quantitative and practical reasons the account is principally restricted to the Ljungan river basin, but I consider, in large, this valley as a model representative for Middle Norrland as a whole. The approach in this dissertation is not to be looked upon as a break with the principal viewpoints in *Västernorrlands förhistoria*, nor as a shift of research paradigm. It is, furthermore, to be considered as a tentative, alternative approach with more respect to the conditions for the whole prehistory and to the earlier, regional prerequisites for the Iron Age agrarian culture.

It is my pleasant duty here to express the following acknowledgements.

Professor Greta Arwidsson was my stimulating teacher up to the licentiate degree. My present teacher, Professor Mats P. Malmer, has through repeated encouragement and advice and creative criticism of my manuscript highly promoted this work. Professor Evert Baudou kindly gave me the opportunity to

inspiring co-operation in *Västernorrlands förhistoria* and also to repeated participation in the project Early Norrland. The motto of this book may be seen as a mark of years of inspiration by writings and talks of Professor Carl-Axel Moberg.

The activity at the Department for the Survey of Ancient Monuments has always had the form of a stimulating team-work with friends and antiquarian colleagues, characterized by a continuous exchange of experiences. My former superiors, Erik B. Lundberg and Folke Hallberg, put me in charge of the field work in Middle Norrland, encouraged me to study the recorded material and upon two occasions granted me leave of absence for that purpose. Of my colleagues Harry Thålin and Claes Varenius have been especially generous in supplying information on the material from Västernorrland, likewise Gunnar Ekelund - before his decease - on his excavations in Medelpad. With Gerhard Winberg and Åke Hyenstrand I have for years continually had friendly discussions and co-operation concerning Norrlandic and other archaeological material. Among my numerous field assistants in Middle Norrland, I want to especially mention my friends Yngve Söderdahl, Bertil Gardell and Rainer Olebratt for many years of co-operation. I also had several years of co-operation in Middle Norrland with my younger colleagues Lars Löthman, Björn Winberg, Gert Magnusson and Ronnie Jensen.

During my field work I have also had the pleasure of co-operating with representatives of the regional organization, above all the County Custodians of Antiquities Bo Hellman, Sten Rentzhog and Göran Rosander. The first named has also, together with Bengt Häger, facilitated my studies for *Västernorrlands förhistoria*. I am also greatly indebted to the County Council of Västernorrland for financing a great part of my work for that book.

Docent Björn Ambrosiani and Antiquarians Elisabeth Iregren and Harald Sundlin kindly made unpublished manuscripts available to me. Chief surveyor Valter Larsson and Dr Roger Engelmark gave me information through personal communication.

Phyllis Anderson, B.A., competently and devotedly translated my manuscript and checked smaller texts of mine. Bert Hellberg translated the summary in the first section and gave advice in terminological questions. Annica Boklund skilfully drew the illustrations and Anthony Robertson-Pearce prepared them photographically for publication. Marianne Frykman and Ingrid Beiwert helpfully assisted me in several respects.

In this context I also want to mention that Gunilla Edenström made the drawn illustrations in my part of *Västernorrlands förhistoria*, Bengt Händel drew the vignette and Sören Hallgren made most of the photographic work for that book. My colleagues at the Museum of National Antiquities were also helpful in the preparation of that book, and the assistants at the Library of the Royal Academy of Letters, History and Antiquities have patiently provided me with literature for all my work.

Hanserik Tönnheim at Akademilitteratur skilfully and rapidly handled the production of this thesis, and Harriet Palm, Gungerds skrivtjänst, in the same way typewrote the manuscript for the printing, which was conducted by GOTAB.

To all, who in these ways have contributed to my field work, studies and writing concerning the Prehistory of Middle Norrland, I want to sincerely express my gratitude.

Last but not least: the dedication of this book expresses my plain but hearty thanks for years of unselfish support and unfailing patience with my almost continual occupation with archaeology.

Täby Easter Eve 1979

K-G. Selinge

1. Iron Age agrarian culture of Västernorrland, summary

1.1 METHOD AND SOURCE MATERIAL

1.1.1 *The settlement archaeological method* may be applied on settlements' units or on settlements' regions. A regional study has traditionally been descriptive and comparative. By proceeding from ancient monuments one may either work with an analytical-analogical or general-quantitative method, and these monuments can, from a typological point of view, be dealt with in the same way as artefacts. The chosen method is general-quantitative with ancient monuments as the main source. From a chronological point of view artefact finds are the most important. For a quantitative settlement analysis all known graves and settlement remains are used. The Iron Age settled areas constitute through their monument types, their distribution, topographical conditions and geological environments, a regional unit with well-defined prerequisites.

1.1.2 *Research history* comprises four main, older recordings of ancient monuments. These proved useful in the Ancient Monument Survey of the Central Board of National Antiquities from the 1960's, which is the main source for this work. A minute comparison of these works gave a total number of known ancient monuments which was used as a quantitative basis. Excavation reports and museums' catalogues were examined for localization and evaluation of the grave finds, mainly with a purpose of achieving a settlement archaeological chronology.

1.1.3 *The ancient monuments* of the Iron Age are almost always of mound character - as a rule marked and well constructed round barrows - but some few graves are of other form and material. About 4 000 monuments are known in the whole county, of which today 2 700 have been preserved. 70 % are barrows, the rest are mostly turfed stone settings, but terraced house foundations, hillforts and rune stones occur (table p. 168). According to Norrlandic conditions, the province of Medelpad is rather rich in ancient monuments but Norrland as a whole has a marginal touch in comparison with the central Iron Age provinces.

1.1.4 *The combinations and distribution configuration* of the ancient monuments are characteristic for different grave types and of different regions. Cemeteries are highly dominant in the Mälar provinces, while the rest of the country has more monuments located separately or in smaller groups. Differences in the distribution configuration may refer to conditions in the prehistoric society. The concept of distribution configuration, in the Västernorrland material is defined in five groups (p. 169 f): single graves, two types of group configurations and two sizes of cemeteries.

1.1.5 *The representativeness of the registered graves* constitutes two problems: the representativeness of the registered graves for the preserved ones and the representativeness of the latter for the original graves. The monuments' "history of discovery" is illustrated in a series of diagrams (p. 171). The percentage of preserved monuments is highest in the larger spatial units (60-90 %) and lower in the smaller ones (20-60 %) and generally lower in Ångermanland than in Medelpad. Damages to the monuments (table p. 173) is of source-critical significance. Plundering pits occur in 40 %

of the mounds, and damage by cultivation may also be serious. The representativeness of the preserved graves is lower in Ångermanland than in Medelpad but commensurable within both provinces. The representativeness of the original monuments is only partly known from written records. The effect of the demographic and agricultural development on the cultural landscape is important after c 1850, when the increase of population raised the demand for arable land. The destruction of ancient monuments is not, however, proportional to the increase of the cultivation, because of the localization of the latter. It is highest in settled areas with a great share of sedimentary soils, and it was not extensive before the older recordings. The representativeness is best in the larger settled areas of Medelpad (chart p. 179).

1.2 ENVIRONMENT AND EXTENSION

1.2.1 *The ecological conditions* in the river valleys below the highest coastline and in lowland basins in the coastal land, where also the most dense farming areas of historical times are located, are the strongest evidence of the culture's agrarian character. The river valleys consist most of sedimentary soils with moraine in the valley sides. Ancient monuments are to be found on both these soils and, as a rule, in near contact with the settlement of later times (Fig. 7-13). The majority of the settled areas had during the Iron Age direct contact with the sea. Only one of the larger areas has been colonized in a contemporary river valley, and only one of the smaller is situated more than 100 meters above SL. The localization is a consequence of the situation of the cultivable soils. The climate in the Iron Age was comparable to that of today, which constitutes one of the most favoured parts of Norrland from an agrarian point of view. Valleys and coastal plains were intensely exploited nearby regions, the highlands and the water courses were extensively exploited. The localization of settlement is a consequence of these conditions.

1.2.2 *The spatial dispersion of settled areas* are conditioned by the topographical prerequisites and also influenced by the colonization process. A continually conditioned relation to historic settlement and administration is obvious, above all to the Medieval parishes. The total number of known ancient monument is displayed in two frequency maps (inlaid sheets), where the monument frequency is registered in a grid with 194 squares in Medelpad and 214 in Ångermanland, each 1.56 km^2. The average density varies considerably and is highest in the greater areas of Medelpad. The distribution is expressed in comparable spatial units, closely connected with topographical and administrative divisions and named "settled areas" (Sw. *bygd*, definition p. 191). The medians in the monument density in the settled areas consitute the limits in the frequency grid. The density may be seen as an expression of the carrying capacity of the environment as a basis for settlement and may have both chronological and colonization-chorological aspects. The change of religion at the end of the Iron Age appears in different areas in different stages of colonization, which affects the picture.

1.2.3 *The graves within the settled areas* are accounted for in detail in the tables (p. 194 f). Eleven areas belong to Medelpad and 18 to Ångermanland, seven of which are characterized as large areas with more than 100 ancient monuments. 90 % of the monuments are to be found within these five areas in Medelpad and 61 % within the two in Ångermanland. In the larger areas 60-80 % of all graves consist of barrows, but the functional difference to other grave types are with few exceptions insignificant. No noteworthy differences between the areas occur in grave-building customs, disregarding a slight tendency for the Tuna-Attmar area. The sizes of the barrows and the turfed stone settings are shown in charts (Fig. 15-17). The share of large

barrows (Fig. 1, 18 and 82-84) is proportionately higher than in other Iron Age provinces. Some 50 barrows are more than 20 meters in diameter - most of them situated in Medelpad - and 11 of them are more than 35 meters. Visible constructions are few, and the lack of variation is striking, especially in comparison with Early Iron Age graves in other provinces. Edge constructions (surrounding stone chains and trenches) are more common in Medelpad (table p. 202, Fig. 19, 20, 25). The distribution configurations are illustrated on maps (Fig. 21-24). Large cemeteries are few and remind one of the Mälar Valley. Small cemeteries, groups of graves and single graves lie spread in considerable terrain sectors. The percentage distribution of the configurations (table p. 207) shows that single barrows constitute 35-60 % of all burial grounds, but that most graves are located in small cemeteries and in small, close groups. No regional tendencies may be seen. The percentage of graves in cemeteries is probably low in comparison with other Iron Age provinces. 65-75 % of all grave sites in Medelpad are located on moraine and the rest almost exclusively on sedimentary soils. About half of the sites are situated in old pastures and the majority of the others on arable land. There is an obvious parallel between the location of the graves and the settlement and cultivation of the present day, and consequently there ought to be a continuity in both a spatial and economic respect.

1.3 CHRONOLOGY AND SETTLEMENT HISTORY

1.3.1 As *chronological sources* all the grave finds of the county were examined. For burial customs the usual terms of urn grave, bone layer, cremation pit, cremation layer and inhumation grave are used, to which is here added "a cauldron grave". An exhaustive typological classification is not aimed at, but the material has been grouped in functional principal categories, mainly based on comparative studies of relevant literature. The usual concept of "expert finds" is not applicable. Instead the investigatory documentation may be grouped into five classes (table p. 216), which give an idea of their validity. In Medelpad the documentary evidence is distributed rather evenly, in Ångermanland accidentally disclosed finds are more usual. A restriction to absolutely certain closed finds would make the majority useless for settlement historical research and make a quantitative treatment impossible. Beside reliable find combinations even single objects without known combinations are usable in a varying degree, which is why a source-critical examination of all grave finds is the most useful chronological method in a settlement historical investigation. Land elevation has restricted evidence for chronological purposes in the Iron Age (table p. 218).

1.3.2 *Division into periods* is built upon traditional Iron Age chronology with the dividing line between its early and late parts at 550-600 A.D. The principles of a "long" chronology with arbitrary additions for circulation and retardation of objects is not accepted, but the principles of a "short" chronology, above all laid down by Eggers and Norling-Christensen, are followed. The periodical division is intended for relative datings but hypothetical, absolute datings are stated.

The agrarian culture is an innovation during the 1st century A.D. No clear delimitation exists between the Roman Age and the Migration Period, but the beginning of the latter is defined by the cauldron grave custom in the 4th century A.D. The beginning of the Vendel Period is defined by the appearance of combinations with symmetrical brooches and certain types of pins in the 6th century. The periods c. A.D. 350-400 respectively 550-600 then both obtain the character of two parallel traditions in the find material - a normal phenomenon at overlapping periods. The transition to the Viking Age is, because of lacking finds from the 8th century, not very clear but is defined by the emergence of "Birka" types c. A.D. 800. The end of the Iron Age must

be undeterminedly assigned to the 11th century. Inexactly positioned finds are attributed to Early and Late Iron Age or just to Iron Age. The period division is shown in a chart (p. 224).

1.3.3 *Chronological stratifications* of the finds are reported in tables with comments concerning the chronological distribution of the grave finds, grave types and constructions. The distribution in periods and spatial units (table p. 225) show that in Medelpad out of 312 finds 142 have been dated to Early and 92 to Late Iron Age, while 78 have been determined just to the Iron Age. In Ångermanland only 12 finds have been dated to the Early but 121 to the Late Iron Age. Data concerning finds, ancient monument types, constructions etc. vary on account of the quality of documentation.

Ancient monument types are in many other areas significant of the Early respectively Late Iron Age. In Västernorrland (tables p. 227 and 228) barrows have the same frequencies during the whole Iron Age, which is a striking difference to E. Central Sweden. The exterior type of the grave monument is consequently not chronologically conditioned. The distribution configurations (table p. 229) show in Medelpad very even distribution for the whole Iron Age (compare percentage distribution p. 230). The grave numbers of the ancient monument sites are consequently not directly dependent on the length of the settlement period. Several sites may have been used for one habitation, but large cemeteries may have been used a long time. Construction details show in Medelpad an obvious predominance of the edge chains to the Early Iron Age. Dated edge trenches have a tendency towards the Late Iron Age, strengthened by altitude conditions. Of the burial customs (table p. 233) inhumation graves are most common in Ångermanland, the majority from the late Viking Age. In Medelpad they are more common during the Early Iron Age, a manifestation of a common Scandinavian tradition. The cremation burial custom during the Early Iron Age is varied but cremation layers are most common during the whole Iron Age. Grave building traditions and burial customs are, then, of a kind here during the Early Iron Age, which do not appear in the Mälar Valley before the Late Iron Age. The changes in burial custom and settlement, which characterizes the Mälar Valley in the Migration Period, are not observable in Västernorrland. Cremation customs and grave constructions may roughly date a great number of undated graves to the Early respectively Late Iron Ages (table p. 236). However, three-fourth of the total number of ancient monuments are still undated.

Archaeological investigations are samples from a base population, in this case graves. These have, as a rule, been dated by proceeding from types and combinations, which is not possible in Västernorrland, because of the uniformity of the traditions. The percentages of dated ancient monuments (table p. 237) are varying but are probably higher than normal within comparable grave populations. The ways of bringing forth the finds may be grouped in accidental finds, rescue excavations and research excavations (table p. 238). The scientific excavations work with selected objects, as a great part of which may be tested according to size against the whole population (chart p. 239). They seem to be representative, which is also universally shown concerning large mounds. Finds with known distribution configurations can be tested against the total population (table p. 240) with good representativeness. The accidentally produced finds show clear signs of a random occurrence. Consequently, an approximate dating of the whole ancient monument population based upon the monuments which have produced finds is worth trying.

1.3.4 *The colonization and settlement history* is presented in diagrammatic models for the settled areas (Fig. 31-32), the find and construction datings in block diagrams and the representation of these on the whole grave population in cumulative polygons, all in total numbers. The diagrams give,

first, a picture of the grave production but quantity, uniformity and representativeness make them, however, the best measure of settlement. The curves display two principle trends. In Medelpad a marked rise is clear during the Early Iron Age - in Ångermanland first in the latest Iron Age. A pronounced decrease in the grave production after the middle of the Iron Age is obvious in Medelpad and visible in Ångermanland. The explanation for this may lie in the research situation, in changes concerning economy and/or burial tradition or in an actual settlement decrease. The third possibility may be related to similar developments in several parts of Scandinavia, and this hypothesis seems at present to be the most probable one. The later expansion is very pronounced in Ångermanland but evident also in Medelpad. The transition to the Christian era takes place in a very expansive phase. The combined polygons (Fig. 33) present together with the distribution maps a chronological and spatial model of the Iron Age settlement development.

1.4 FIND HORIZONS - TRADITION AND INNOVATION

A selective examination of the find material is made by grouping these into find horizons according to the defined periods. The material culture of the provinces is as a whole treated as one regional sequence.

1.4.1 The *Roman Iron Age* as an *era of colonization* from the 1st century A.D. is represented by listed weapon finds (table p. 253). Tables of this kind record the parish number in the Register of Ancient Monuments, monument type, burial custom, objects in main groups, dating and museum inventory number. The weapon finds indicate connections with both Norway and S Scandinavia (complete example Fig. 35). In women's graves different bone objects are typical (Fig. 36-37). Some gold finds (Fig. 38) are probably grave finds. The richest grave from the Roman Age is an inhumation one from Njurunda (Fig. 39), which belongs to a group of magnificent Scandinavian graves from the 4th century.

1.4.2 The *Migration Period* has the character of a *settlement boom* and only an important selection is presented. The cauldron graves (table p. 262) represent a marked horizon in large mounds (Fig. 40) from before and around 400 A.D. Glasses and pottery occur in a number of finds from a greater part of the Migration Period (table p. 265), among which are the oldest known graves in Ångermanland. There are 17 imported glasses and 22 ceramic vessels (Fig. 41), the majority from the 5th century. Other objects in these graves are of a more general character but often fairly rich. A large chamber grave from Högom is a leading find from the later part of the period (Fig. 46-47), found in a 40 m wide barrow. The equipment is very complete in all regards. A similar, and somewhat later grave from the 6th century, Timrå prästbol, is less well equipped. In this horizon agraffe buttons are leading artefacts, brooches are common (table p. 272, Fig. 49-50) and bone objects still occur. Counterparts are to be found in the Mälar Valley (for instance at the Helgö workshops) but connections westwards are also probable.

1.4.3 In a *Summary of the Early Iron Age* it is established that the finds indicate contacts with great parts of Scandinavia already during the Roman Age, and Medelpad is a part of a general Scandinavian region with continental contacts. Quantitative ancient monumental conditions and geographical prerequisites speak for a colonization from the Mälar Valley while the grave building practice and burial custom are more similar to those of W Scandinavia. The Migration Period shows a pronounced internal continuity with many parallels in most parts of Scandinavia. Bone objects and bronze and pottery vessels have counterparts in Norway but contacts with Central Sweden is nowadays especially obvious in the later part of the period. Västernorrland's Early Iron Age is characterized by lively external connections and a marked internal independence.

1.4.4 The *Vendel Period* is a time of *retardation*, most evidently characterized by a find horizon before and after A.D. 600 (table p. 285). Symmetrical brooches and beads occur. Connected to Uppland's Vendel finds are, for instance, belt mountings (Fig. 52) and a few weapon graves (Fig. 53). During the 7th century the former connections between the S and the W may still go through Medelpad, but in the 8th century finds are almost completely lacking.

1.4.5 The *Viking Age* marks a new *expansion*, above all in Ångermanland. The handicraft uniformity of this period facilitates comparisons between older and younger types in spite of poor grave find documentation. Tortoise brooches (table p. 292) show two tendencies: spatial predominance in Ångermanland and chronological predominance of younger types, both probably based on settlement-historical causes. Coins have been found in five Viking Age graves (Fig. 55) and indicate datings of the brooches in three horizons. In the smaller settled areas of Ångermanland the younger is completely predominant. The type distribution of the weapon finds (table p. 297) indicate the same two tendencies. A group of inhumation graves constitute the last horizon, two from Medelpad (Fig. 58-59) but mostly from Ångermanland (Fig. 60-62), where large cemeteries in Överlännäs are well represented. Sparse grave gifts indicate Christian influences in several cases. The Viking Age find material is of a general Scandinavian type. Its predominance in Ångermanland must be a result of a more forceful settlement expansion.

1.5 SETTLEMENT AND POPULATION

In this section problems concerning the functional basic units are considered.

1.5.1 *The problem of the settlement units* cannot here be handled according to total investigations of such units. The distribution of finds and the distribution configuration of the monuments make an identification of functional units difficult. Three alternative models are tried.

The model *Vattjom* represents a large site with scattered graves, situated in Tuna parish. It is clearly delimited and has many dated graves. The known finds are localized in detail to known monuments (Fig. 63). The graves form five concentrations, and Early Iron Age graves are found in all, Late Iron Age graves in three of these. All graves have the same relationship to settlement and cultivation. The question of contemporaneousness or chronological order is fundamental. Each group may not be a unit of its own, nor do they form a chronological series, nor is any fusion evidenced. Vattjom probably constitutes one settlement unit with free disposal of the land for both settlement, cultivation and burials.

The model *Holm and Björkå* represents sites with large cemeteries, one with 50 and one with 20 graves, situated at the estate Holm in Överlännäs. This consists of six original units forming ribbon-shaped figures according to the river (Fig. 64). The cemetery of Holm (Fig. 65-66) has datings from the Migration, Vendel and Viking Periods and the Staberg cemetery (Fig. 67) from the Vendel and Viking Periods with unknown earlier delimitation. The cemetery ought to be the only burial grounds of the units, despite the small grave numbers. The neighbouring hamlets may have been colonized first during the Viking Age from Holm and Staberg. Firm tradition and longer usage may constitute larger cemeteries.

The model *Skön Valley* represents several minor, comparable units with small, historically known hamlets along a valley (in Skön parish). An inlet constitutes a base line and the boundaries cut these at Viking Age level (Fig. 68). The monuments and the boundaries form two patterns without any obvious relation. Grave numbers are varying and grave datings few. A quantitative comparison of the two patterns is made, based upon monuments, tax rolls of

the 1500's and settlement names (table p. 323). Temporary abandonment occurs and the units are small in the 1500's (2-4 hectares arable land). There is no apparent co-variance between monuments and land measures, but the general strong relationship between monuments, names and settlements indicate a continuous use of the landscape. A continuity from the Iron Age to the 1500's, with temporary variations during both Iron and Middle Ages is most probable.

1.5.2 *The farm's houses* are known as c. 30 house foundation terraces, the habitations are probably, however, predominantly lying in today's hamlet sites. The cemetery at Högom (Fig. 70) was the place of a permanent settlement in the later Roman Age and earlier Migration Period. Three large barrows have been excavated, and thick culture layers were found under two of them, containing mainly typical habitation finds. In each culture layer the foundation of a hall-shaped house, c. 25 x 8 meters large, with two rows of bearing posts and walls of wood and wattle and daub, were found (Fig. 71). The area of the homestead had been successively covered by the graves.

The house foundation terraces resemble these houses in length but vary between 10 and 45 meters. They may be partly stone-lined, have draining grooves (Fig. 72) and are located close to graves. Tillage traces are, however, unusual (Fig. 23). None have been dated. One site at Prästbolet in Tuna encloses a rather complete Iron Age farmstead with 33 graves, 4 house foundation terraces and extensive tillage traces (Fig. 73-75). No regular plan for lots, infields and outfields, fences, etc. is visible, which is why wood enclosures are conceivable. The chronology is unknown but an Early Iron Age date is possible.

1.5.3 *The population problem* is not possible to reliably solve without chronologically determined settlement units, but even hypothetical estimations are of interest for the interpretation of the society. Vattjom's c. 130 preserved graves from 10 centuries may be estimated to correspond to c. 200 burials. Prerequiring a mortality rate of 40 per mill. for complete populations, it is realistic to calculate that the 20 graves per century represent half of the population, i.e. corresponding to a rate of 20 per mill. of these. This means a population of 10 people in Vattjom - for instance a family of three generations with a total renewal every fifty years. Wide variations are possible but the numbers are realistic. A corresponding calculation for the Holm cemetery may indicate for 600 years and 20 per mill. at most c. 4 individuals, which appear to lie beyond the limits of possibility for continuous settlement. The Staberg cemetery gives in the corresponding way at most 6 individuals.

Corresponding estimations may also be made for the settled areas, composed of varying numbers of settlement units. The Timrå area's 135 graves will - because of severe destruction - be estimated at 250 burials, which give at most 12-13 individuals. The settled area cannot, however, for topographical reasons be one unit. In the improbable, most favourable case of three units they would have 4 individuals each. The Skön-Alnö area shows two clear maxima (Fig. 31) during the Migration and Viking Periods. For a tentative number of 800 graves at most, an average population of 44 people is given, i.e. c. 95 during the Migration and c. 60 during the Viking Period. The number of historically named units are at least 30, which is why they would at most have 3 respectively 2 individuals during these two stages. The figures are too small to correspond to vigorous units. Ådalen and Ullånger settled areas give similar numbers.

The values of 2-5 individuals per unit are too small to permit normal cultivation of Iron Age type. An analogy to these low numbers is given in Norway,

while in the Mälar Valley 10-15 people have been estimated. The too few graves in Västernorrland may be interpreted as depending on grave customs. Only a selection of the population has been considered worthy of burial. The graves of the others - both adults and children - are unknown. The buried number may be about one-quarter of the total population, i.e. two adults from each generation.

1.6 ECONOMIC AND SOCIAL CONDITIONS

Purely archaeological sources for subsistence activities are rare because of the burial customs, but some exist both from main and subsidiary ways of maintenance.

1.6.1 *Agriculture* may be illustrated partially by remains of implements and partially by cultivation traces and landscape effects. Harvesting implements are known at some places (Fig. 76), while tillage implements are unusual. Domestic work is represented in most of the implements for handicraft and textile finds. Cultivation marks are imperfectly registered and probably rare because of continuous cultivation and are, moreover, difficult to date. The best example is the farm at Tuna (Fig. 73) with field terraces, clearings and smaller, concave field surfaces. Tilling by hoeing and spading may be presupposed, while the larger fields have been cultivated by ard, which is well documented under one of the mounds at Högom (Fig. 77). The importance of meadows is emphasized by the small field areas, the 1500's tax roll data and land surveyors' maps of the Skön Valley. Woodland grazing has probably occurred as well as manuring - at least during the Viking Age. The availability of arable ground, however, governed colonization. Pollen analyses in Ångermanland have no direct contact with settled areas but are of fundamental interest. They show primarily a cultivated and open landscape from the Viking Age - corresponding to the archaeological sources - and secondly a more extensive cultivation and/or clearance in intervals much earlier, the latter difficult to interpret from the Iron Age data.

Considering subsidiary ways of livelihood only general considerations are possible. Fishing in flowing waters has surely been practised as in recorded times, but the waterways did not create settlement. Legends attached to unusual ancient monuments and place names indicate the importance of salmon fishing. Hunting and trapping may have been carried out in the woodlands. Trapping pits are not connected with the Iron Age areas but may have been used. Legends about monuments have also been connected with hunting (Fig. 14).

1.6.2 *Trade and social differentiation* may be evidenced in rich grave equipments or monumental grave structures as documents of the social contexts of the deceased and of the resources of their estates. Nineteen barrows in Medelpad and four in Ångermanland are more than 25 m in diameter and, in addition, 27 more are larger than 20 meters. In Medelpad all of these except the one at Tuna are situated in four coastal areas, and in Ångermanland they lie near Ångermanälven (Fig. 79-80). The large mounds' sites are strategically situated for trade at the coast or the river mouths, for instance Kvissle-Prästbolet in Njurunda on a small shallow bay (Fig. 81), probably a farm and a harbour location at about A.D. 400-500 (Fig. 82-83). The other localities are comparable. These prospering sites are contemporary with the Migration Period settlement and find boom, which with great probability was channelled via these places, owned by enterprising representatives of the peasant class. They probably functioned as trade centers between the inland and outer contacts. No finds from the Later Iron Age have been found in mounds larger than 20 m. The decline during the Vendel Period, therefore, includes the ceasation of these functions. The Viking Age chamber graves (Fig. 58-62 and 79-80) may be a more modest social indication but are more influenced by changes in grave custom. No certain evidence exists proving a connection

between large mounds and special place names or Medieval Crown estates or administrative division.

No places for iron production have been found in Västernorrland, but iron trading is documented by deposited finds of iron ingots (Fig. 79-80 and 85). In Medelpad 21 finds with c. 380 objects are known, in Ångermanland only a few. It is not clear if Medelpad is a producing province or only a consuming one, in which case the finds may indicate trade routes.

Treasure finds have a central point in Ångermanland. One is of Migration Period character (Fig. 86), the other (8 in Ångermanland and 3 in Medelpad) are silver treasures from the late Viking Age, as a rule, the 11th century. Their primary importance is as evidence of a renewed boom with economic prerequisites for creation of properties.

1.6.3 *Warfare* may be evidenced in the weapons, which were laid down in graves during the whole Iron Age. They represent a high evaluation of the use of weapons - only as symbols, as a social power resource or as defence weapons. The 10 hillforts - 6 in Medelpad and 4 in Ångermanland - may be an evidence of the need for defensive measures. They lie, as a rule, somewhat withdrawn from the settled areas and are not markedly offensive (Fig. 88-89). They may have served as forts for refuge, probably for local use. None are situated in the great coastal areas with large mounds.

Chapters 7 and 8 in JBV are, in a new form, involved in the following chapters of this book.

2. The valley – a survey

One of the most important prerequisites of the cultural relationships within an area is its physical qualities from a human ecological view-point. Therefore, as an introduction, a short review of the Ljungan Valley and river system from a geographical-geological and topographical-hydrological aspect shall be given here - that is to say, of the cultural systems' habitat dealt with in general. In addition, a short resumé of the emergence of the archaeological source material is necessary.

2.1 LOCATION AND PHYSICAL ENVIRONMENT

The Ljungan River is the smallest of the large mountain rivers in Norrland, and it also has the smallest river basin. This is located in middle Norrland between 12,5 and 17,5 degrees E longitude and between 62 and 63 degrees N latitude (Fig. 1). The greater part of the river basin is located within the provinces of Medelpad and Jämtland, but the main river's upper courses are located within the province of Härjedalen and smaller portions of the river basin's S part reach into the province of Hälsingland. The river runs primarily in an E - W direction and has a lesser inclination towards NW - SE than other mountain rivers. The river basin encompasses 12 850 km^2, and the main river course is 370 km long. Close to 40 % of the river basin belongs to the large Gimån tributary which runs into the main river from the left near Torpshammar. It is 180 km long. In addition to these, there are only lesser tributaries, of which Skärkan, Rövran and Arån in the mountain areas along with Röjan and Getterån in the woodlands may be mentioned. The lake areal within the area of precipitation reaches just more than 7 % (Sundborg 1973:55). The river's original name has probably been *Oghn, known from 1412 in the composition Oghnaroos as the name of the discharge area (Hellbom 1972:65).

Zoning in a number of longitudinal topographical zones, which is characteristic for the whole of Norrland, is also clear although not especially pronounced within the Ljungan Valley. The river's sources lie within the high mountain zone E of the border towards Norway. The high mountains within the Lunndörr, Anaris and Oviken Mountains also delimit the upper valley towards the N, and the tributaries drain the passes in these massifs. The

then following pre-montane region stretches around the Ljungan Valley unusually far to the E and consists, S of the valley, of a pronounced, extensive altitude ridge with several low mountains that reach above the tree line and in the E are concluded by the Klövsjö Mountains. The kinds of rock in these zones are dominated by the mountain chain's mica slate, quartzites and sandstones along with younger Archaean rocks, among others large quartzite nappes (Lundqvist 1969:15 f and pre-quarternary rock map). The land formations are partially dominated by the boundaries of the great nappes in these rock types, which are especially clear near the zone's E border (Lundqvist 1969: 18). The moraines within the pre-montane area are of low fertility (Atlas över Sverige 9 - 10). In the border zone towards the E, however, a projecting band with Cambrio-Silurian rock from the Storsjö area, of importance to settlement localization in the Åsarna-Klövsjö area, is included. In many other Norrlandic river valleys there are, in the pre-montane region, extensive lake chains. In the relatively restricted Ljungan Valley, however, these are of modest proportions. This is related to the valley's slightly developed relief within the river's immediate surroundings (Lundqvist 1969: Pl. 1, Sundborg 1973:57). The valley, projecting into the mountain region, fashions a shallow bay with a relatively high bottom altitude, and high drops appear first near the pre-montane region's steeps in the Åsarna-Klövsjö area.

East of the pre-montane region follows a zone which is dominated by the undulating hilly Norrland terrain (Lundqvist 1969:18). The rock here is made up, to a great degree, of Rätan or Revsund's granites which often show tectonic fracture zones in different directions. Especially in the Revsund area around the upper Gimån the terrain is considerably undulating with valleys, crossing in different directions, with a large quantity of bare rock in the crests and precipices. In that area, therefore, several considerably broken lakes with islands, bays, straits and winding shores are also formed. Farthest to the NW, however, the river basin reaches, with a smaller part around the Locknesjön, into the Cambrio-Silurian area of Jämtland with more gentle land formations and moraine clays with high fertility. Otherwise, this inland area is characterized by primary rock moraines with very moderate fertility (Atlas över Sverige 9 - 10), but a certain moraine distribution from the Cambrio-Silurian area has been of importance (Lundqvist 1969:37). Around the main river valley farthest W in Medelpad, the terrain is flatter and partly filled by extensive open lake systems with broken shores and without sharply eroded valley bottoms. The moraine has, in that area on both sides of the province's border, often a high frequency of boulders, and the bog areal is in places considerable (Lundqvist 1969: Pl.3). In places, however, are even considerable glacio-fluvial deposits.

The undulating hilly landscape's typical "Norrland's terrain" continues towards the E on both sides of the lower valley right out to the sea. Its crests make up a slowly sinking peneplain towards the E. The rock here is predominantly gneiss with moderate fertility (Rudberg 1962:13). The mountains along the valley sides have here, often through glacial denudation and abrasion during the elevation of the land, been formed into bare and steep, often perpendicular, so-called *flyggberg* (Rudberg 1962:34). These are found even out near the river's discharge, where the mountains in the neighbourhood of Sundsvall constitute the Norrland terrain's outpost towards the sea and the Norrlandic coastal plain. The plateau lands on both sides of the valley consist primarily of moraine with contributions of bog lands. They are penetrated by smaller valleys in different altitudes and as the land sinks towards the E, bay sediments of fine sand and silt appear and,at last - mainly near the transition into the coastal plain - also clays (Rudberg 1962:39). The lakes within the plateau lands are with single exceptions - mainly in the Gimå Valley - as a rule small.

The Ljungan's main valley is cut by the highest coastline at approximately 235 - 240 meters above SL in the Alby area upstream from Ånge (Rudberg 1962: 37, compare Fig. 1). When the valley breaks down from the plateau lands, it wholly changes character here even in the larger formations of the landscape. In inner Medelpad it is consisting of wide and flat valley basins with only slightly terrassed sediment soils, a ridge which is seen in places along the valley, and lakes in bedrock basins in the course of the river (Rudbeck 1962:27, compare JBV: 180 f). Along the lower Ljungan, however, there are even narrow contractions of the valley with sharply clear-cut *flyggberg* in the valley sides - above all between Lake Marmen and the mouth - which gives the valley a fluctuating relief (Sundborg 1973:62). The strong contrasts within the Ljungan Valley and, above all, between that and the narrow lower Indalen has caused the formulation of a hypothesis that the Storsjö basin in Jämtland, during pre-glacial times, may have had its drainage to the Ljungan by way of the Revsund area (Rudberg 1962:33). The changes between the wide basins and narrow contractions create prerequisites for the characteristic settlement distribution in the valley during both the Iron Age and historical times (compare JBV: 181). The bottom of the valley is completely dominated by sediment soils - predominantly silt but also clays and in places coarser river sediments as gravel and sand.

As seen in Fig. 1, the Gimån is cut by the highest coastline a little more than 30 km above the provincial border at an altitude of approximately 240 meters above SL (Lundqvist 1969:176). The valley is not especially deeply cut-out but has, however, partially the character of a through-valley (Lundqvist 1969:23). In the Gimån's lower valley in Medelpad, there are a couple of larger lakes, of which the longish Holmsjön fills out a valley towards the SE. Concerning the terrain formations in general, towards the coast the Selånger Valley may be regarded as a continuation of the Gimån Valley. The Gimån's present-day lower, steep course, lacking a natural valley down to the Ljungan, probably forms a post-glacial river link towards the S (compare Selinge 1978:1.2 with op.cit.). The river lacks, therefore, good prerequisites for localization of early permanent settlement.

The valley of the small Selånger River makes up a considerable flat valley basin which, during the whole of the prehistoric period, was located by a sea bay.The river is 50 km long, and the river basin comprises 450 km^2. Towards the W, the lower valley has an open connection with the Ljungan Valley near Vattjom, and passability from the coast to the upper Ljungan Valley is considerably better here than along the river. It is, therefore, probable that the Iron Age settled area in Selånger can have strong connections with the Ljungan Valley. The Selånger Valley is dominated, as the other coastal valleys, by sediment soils, but here there is also, as in the Ljungan Valley, in places a visable ridge which follows the waterway (Rudberg 1962:40).

2.2 DESCRIPTION OF THE RIVER COURSES

The Ljungan's main course rises in the mountain terrain around Ljungsjöarna at just less than 1 000 meters above SL between the Helags glacial Mountain and the high Härjångs Mountains. The river soon follows a pronounced valley which, to a great degree, is filled by the partly terrassed sediments of the Ljungan glacial lakes. At the village of Ljungdalen these widen into a sand and silt plain at around 625 meters above SL which is attractive to settlement (Lundqvist 1969:320). Downstream from this plain river sediments are deposited through which the river, together with the tributary Skärkan, forms a beautiful meandering course with a delta in Storsjön (Lundqvist 1969: 321, Sundborg 1973:58). Skärkan rises in a low mountain area, rich in lakes, between Helags and Flatruet and joins, after the course through the similar but smaller Skärkan Valley, the river from the right.

Storsjön (565 meters above SL) is the largest lake in upper Ljungan and has, as a rule, broken shores of fine, sandy moraine partially rich in boulders. In very restricted places it has provided a base for settlement. The lake has also several smaller inflows, among others Storån from the mountains in the N.

Downstream from the Storsjön an approximately 50 km long section follows with relatively modest drops, consisting of currents, slack waters, and smaller lakes. Among these the Grucken Lakes (510-497 meters above SL), Flåsjön (465 meters above SL) and the Börtnan Lakes (445 meters above SL) may be mentioned. Several tributaries, of which the largest are Rövran and Aran, drain the passes in the mountain chain in the N and join the river from the left. The river runs predominantly through moraine, but a large degree of bare rock occurs in the upper and glacio-fluvial deposits in the lower valley (Sundborg 1973:60). This part of the valley is, at a late period, very sparsely settled.

The river disembogues after that into the Klövsjö lake system, which with the connected lakes of Fotingen, Lännässjön and Klövsjön (437 meters above SL) fills out a valley, 18 km long, in the direction NNW-SSE below the Klövsjö Mountains' steep, which gives the valley a marked relief (Sundborg 1973: 57). The shores consist of glacio-fluvial and glacio-lacustrine deposits, which in places - above all in the straits between Klövsjön and Lännässjön - form numerous tongues of land, promontories, straits and bays (Fig. 20). The presence of lime has partially given a fertile moraine on the slopes, which is attractive for settlement.

Here the Ljungan leaves the larger valley through a postglacial outflow towards the NE through Skålsjön. Through a steep and winding course without a pronounced valley, the river falls here more than 80 meters in just more than 15 km down to the lake system Hålen-Nästelsjön at 354-353 meters above SL. Together with Rätansjön (349 meters above SL) these lakes fill out a similar valley system in a N-S direction. The lakes are followed throughout the valley by gravelly glacio-fluvial deposits and sediments (Lundqvist 1969:328 f). In this valley, the Ljungan's river basin is only just less than 30 km wide and the watersheds towards the river basins of the Indalsälven and the Ljusnan are situated very near the lake system's N respective S parts. In the latter area, extensive fields of *sandur* (Lundqvist 1969:394) are located.

The river leaves Rätansjön through a new postglacial outflow towards the NE and falls rather steeply down to Handsjön (288 meters above SL). This lake introduces a series of widespread flat lake systems with numerous bays, straits, capes and tongues of land without characteristic valley formations, which occupy the most westerly Medelpad. The largest lakes are Havern (259 meters above SL) and Holmsjön (243 meters above SL), both mainly located in Haverö parish. The lakes are separated by stretches of rapids and are, as a rule, surrounded by moraine that is fairly rich in boulders. They have several smaller inflows, among others from Fåssjön within Hälsingland in the S. The whole of this area is sparsely settled. In the neighbourhood of Alby just downstream from Holmsjön, the river breaks down from the plateau lands through narrow and steep rapids at the level of the highest coastline and reach, thereafter, a valley of completely differing shape.

The lower Ljungan Valley may, therefore, be said to begin upstream from Ånge, where it is widened into a basin with low and flat topography, sediment soils and varied course with small stretches of rapids and ramifications - especially between Ångesjön (158 meters above SL) and Borgsjön (113 meters above SL, compare Selinge 1975:30). The valley is here densely settled. Downstream from Borgsjön follows a marked constriction with high *flyggberg* relatively close to the river and a relatively steep course with rapids, among others Hångstaforsarna (Sundborg 1973:59). Thereafter, the valley widens out again in its characteristic way (Sundborg 1973:62) to the large plain basin around Torpsjön (58 meters above SL), which makes a gentle transition to the surrounding heights and nowadays almost consists of wholly cultivated and settled land (compare JBV: 183). Along this stretch a ridge is seen in several places, which thereafter follows the valley down to Stödesjön (Rudberg 1962:41). In the lower part of this stretch the river's largest tributary flows in from the left.

The Gimån drains several lake systems within the granite area in SE Jämtland. The upper of these are drained out to Bodsjön (307 meters above SL). From the S mainly Hungesjöarna (336 meters above SL) with feeders flow in and from the W, among others, Lake Pån (321 meters above SL). From the N the discharge for Locknesjön (328 meters above SL) joins, which is a source lake unique for the Ljungan Valley, located within the Cambrio-Silurian area and surrounded by moraine clays, attractive for settlement (Lundqvist 1969:338). Bodsjön is drained through a rocky stream to an inlet of the extensive lake of Revsundssjön (288 meters above SL), which consists of numerous straits, inlets and bays around Ammerön, which is said to be the largest lake island

in the country. Because of this, the lake has approximately 200 km of shorelines. It also has a number of small tributaries from the many lakes in the undulating hilly terrain, among which can be named Sundsjön (308 meters above SL) in the N part of the Revsund area, which is surrounded by spotted settlements, that are partially founded on Cambrio-Silurian presence in the moraine (Lundqvist 1969:37).

Revsundssjön is drained towards the E through the Gimån N of Bräcke. This passes downstream several lakes, among which Grötingen (264 meters above SL) and Idsjön (261 meters above SL) may be mentioned. To the latter also a larger tributary is drained from the NW with, among others, Hovdsjön (270 meters above SL). The Gimån passes the highest coastline near Rotselet (236 meters above SL). Upstream from there are gravelly glacio-fluvial deposits and downstream there are sandy delta landscapes (Lundqvist 1969:340 f). Several slack waters with surrounding sediments have, thereafter, created conditions for settlements, mainly in Sörbygden near Hemsjön (208 meters above SL). Downstream from this, the important tributary Ljungån, which drains the Hällesjö Valley with, among others Ansjön (288 meters above SL), debouches from the left. Thereafter, the river discharges into Holmsjön (201 meters above SL) c. 30 km long, which widens - to a great part within Holm parish in Medelpad - in the valley continuing towards the SE. From this the river leaves the valley towards the S and passes, among others, Lake Leringen (196 meters above SL) in order to, lastly, in a steep stretch of rapids fall nearly 120 meters in a distance of c. 6 km down to the Ljungan's altitude of 57 meters above SL near Torpshammar.

The Ljungan Valley has, after the confluence, the same open character with silty soils and cultivated countryside down to Stödesjön (50 meters above SL), in which the river forms a delta (Sundborg 1973:62). Into that also a smaller tributary flows out from the right, which drains, among others Viggesjön (139 meters above SL) which is unique from a cultural-historical point of view (JBV:185). Along the lower Stödesjön appears a moraine, rich in boulders and covered with forest, and after a marked valley contraction with rapids the settlement enlarges again first in the Vattjom area, where the river has an altitude of c. 28 meters above SL. There the Ljungan breaks through the ridge in a sharp bend towards the S and discharges through the rapid Matforsen into Lake Marmen (18.5 meters above SL), which also takes up a greater inflow from lake Vikarn (31 meters above SL) and other lakes to the S. The lakes are surrounded to a great extent by cultivated and settled country.

Downstream from the discharge through the rapid Viforsen in the E, the valley there again grows more narrow with steep *flyggberg* on the N side and immense coarse sediments in the valley, through which the river has eroded down (Sundborg 1973: 62 ff). Near the mouth the river by Kvissle-Nolby again makes two bends around a rock and sediment peninsula, which may be a consequence of fault-planes and of glacial dammings (Sundborg 1973: 65). Before the discharge towards the N in the deep Svartvik Bay, the river receives from the right the tributary Stångån, which drains a lake system with, among others, Lake Öjen (35 meters above SL) in the settled land at the transition to the coastal plain.

2.3 ARCHAEOLOGICAL RECORDINGS

Within the province of Medelpad there are good older recordings of ancient monuments which I have earlier accounted for (Selinge 1969, JBV: 163 f). Further, several less comprehensive older recordings are noted by Enqvist (1943: 23 f). All of these include - in addition to material from oral tradition - solely ancient monuments with visible delimitations above the ground, however, neither Stone Age dwelling sites nor other sites without visible features. Within Jämtland and Härjedalen are - except from some notations in the so-called "*rannsakningar om antikviteter*" (inquiries for antiquities) from the 1600's (Ståhle 1960: 253 ff) - comparable earlier recordings of the same systematical character as in Medelpad totally lacking, but sporadical notations are known from the latter part of the 1800's (Olsson 1889-1902). The areas within the Ljungan Valley do not, however, belong to the richest of the county in ancient monuments and are, therefore, little noticed in this context. Archaeological activity during the beginning of the 1900's mainly concerned excavations of prehistoric grave constructions both in Medelpad (Adlerz 1901 and 1904) and in Jämtland (Festin 1913 and 1914, Kjellmark 1909 and 1913), while the need of general surveys at that time was very little noticed.

During the 1940's the Central Board of National Antiquities began cultural-historical investigations of the river valleys in middle Norrland in connection with schemes for water power regulations, of which the exploitation rate had greatly increased during the second World War (see Janson & Hvarfner 1966 and Janson 1964). One of the earliest of these concerned the lower Gimån in connection with its regulation for the power station at Torpshammar in 1943. During the first part of the 1950's investigations of the same type were undertaken within Holmsjön in Haverö parish. Both of these were managed

by Sverker Janson (1966: 116). During the latter part of the 1950's and around 1960 extensive courses of the main river were surveyed - partly from Stödesjön up to and including Ångesjön, partly within Rätansjön, Handsjön and other lakes upstream from Lake Havern and partly Storsjön in the upper course. These works were directed by Harald Hvarfner. During the 1960's chosen objects within some of these survey areas were excavated, and at the same time the upper Ljungan between Storsjön and Rätansjön was surveyed under the direction of Björn Ambrosiani. During the 1970's, in conclusion, Jan Norrman carried out field work between Holmsjön and Ångesjön and between Borgsjön and Torpsjön along with some excavations in the upper Ljungan (for all: reports in ATA). Unaffected by investigations for water regulations are today, therefore, in the main river solely the sources upstream from Storsjön, Havern, the Marmen area and the area downstream from that. The same is valid for the numerous smaller tributaries, the beaches of which still, to a great extent, are archeologically unknown. In the Gimån the whole river system upstream from Holmsjön is uninvestigated in this respect. This lake system today constitutes one of the largest which has been preserved from water regulations in middle Norrland.

As I have more closely analyzed concerning the river Ångermanälven (Selinge 1978: 3.3) and the rivers Indalsälven and Ljungan (Selinge 1979: 3.2) the source validity of these investigations is varying. In the first place, one has sought dwelling sites carrying stone artefacts in the mere beach zone. A source of error concerning the oldest reconnaissances is the then insufficient knowledge about the nature of the material from these dwelling sites - in, for example, the Gimå investigation cracked stone might not have been observed. During the whole of the 1950's, probably, also a certain selection in the search has taken place originating in the beaches' natural characteristics. Appearances in turfed ground above the beach scarps might not generally have been looked for before the 1960's (compare Meschke 1977:12). Varying estimations have occured, among others concerning the required amount and kind of indications of Stone Age dwelling sites. One can also apprehend that later use of the beach zone - for example for stores of clearing stones - have made certain surveys more difficult, which, among others, may be a contributing factor that almost no Stone Age dwelling sites have been found in the cultivated valley downstream from Ångesjön (compare Baudou 1977: 105). The registration of ancient monuments of other types than Stone Age dwelling sites in connection with the water regulation surveys have, upon later inspections, proven to be of varying quality and, as a rule, to be incomplete.

In certain lake systems, because of the present-day damming heights, all further investigations are impossible - for example in Lake Leringen and the Flåsjö water magazine - and in others possible only with severe difficulties - for example in Storsjön and Holmsjön in Haverö. In several other water magazines are, on the other hand, the regulation heights so low, that in any case the naturally, more highly located lakes may be investigated after regulation with success. Such later controls have, within the upper part of the valley, been made in connection with the Survey of Ancient Monuments for the Economic Map of Sweden during the 1970's (concerning this see latest Hyenstrand and Winberg 1978 and Selinge 1978 B).

This enterprise was begun within the basin area in 1964 with Medelpad's coastal parishes. Medelpad's inland, except for Haverö parish, and the lower Gimå area within Jämtland, were surveyed during 1965-1966. The upper Gimå area was surveyed in 1967-1968 and Haverö parish in 1969. The parish of Rätan and the area within Hälsingland around Havern was surveyed in 1971 and the remaining parts of the upper Ljungan - that is to say, Åsarna, Klövsjö and Storsjö parishes - in 1974. With exception of Stöde and Holm parishes in Medelpad, where Claes Varenius served as director of the field work, the direction and inspection of the survey within the whole basin area has been carried out by myself. Within Haverö, Åsarna and Klövsjö parishes, Y. Söderdahl has served as assistent director. Further, around 25 assistents have participated in the survey, several at repeated sojourns.

Because of cartographical reasons, this survey of ancient monuments has long been restricted to features with visible delimitations above the ground. In practice, this has implied an emphasis on prehistoric graves (Hyenstrand 1978: 71). Functional ancient monuments (compare 3.1 below) have, however, by degrees been registered on a larger scale, and in Norrland that concerns, from a quantitative view, above all trapping pits (Selinge 1978 B: 82). Concerning these objects, the survey may be considered homogeneous within the whole basin area - possibly with some reservation concerning trapping pits nearest the coast. Due to their nature, the number of trapping pits could be generally increased with greater resources. For source critical viewpoints of the stock of prehistoric graves within the Iron Age settled areas is refered to JBV (170 ff). Graves in the inland shall be dealt with below (4.1.4).

Systematic surveying of shore-bound accumulated dwelling site finds was begun, on the other hand, first in 1970, partially because of the preceeding observations in dammed lakes and partially because of the resources that then, to

some degree, could be set aside for this (Selinge 1978 B: 86 f). Within the basin area, therefore, such surveys have been undertaken only within the main river upstream from the province border between Medelpad and Jämtland. Because of the present damming heights, this surveying is reliable, in general from the province border and up to and including the Börtnan Lakes, but even here one may naturally find still more dwelling sites. Within the three parishes in this area, through lake regulation surveys, 65 Stone Age sites had been noticed. During the survey of ancient monuments these have been increased to 204 sites, which is an increase of more than three times. One has reason to expect that a comparable increase would appear upon the re-surveying of other river courses - in any case those above the highest coast-line. This would, for example, be valid for Holmsjön in Haverö and Holmsjön in Holm parishes and after test-pit sampling probably also the smaller lakes in the open, lower Ljungan Valley. Likewise surely a large number of sites would be found within still unsurveyed districts with empirically suitable dwelling site environments - for example, within the Gimå system in Jämtland (Selinge 1976: 44) and at Havern, in certain cases probably also in smaller lakes in small tributaries. For a quantitative analysis, therefore, at present only dwelling sites within Rätan, Åsarna and Klövsjö parishes are suitable. For qualitative evaluations - for example in questions of chronology and technique - are, on the other hand, investigated dwelling sites a primary source, no matter where these are located. In addition, stray finds of stone artefacts may have importance for both spatial and chronological deductions - above all within areas without known dwelling sites. The situation of the survey can be seen in Fig. 2.

3. Sources and method for generalizing settlement archaeology

On an earlier occasion I have very briefly, and in main points, characterized three archaeological complexes in Middle Norrland (Selinge 1973:219 ff). That rough division was principally built upon chorological, morphological, and ecological relationships concerning the stock of ancient monuments. This was also quantified concerning the graves from the Bronze and Iron Ages, while the dwelling sites carrying stone artefacts were left out of the discussion in the existing state of the source material. The data basis was of an empirical character and the conclusions, which were formulated as three hypotheses (Selinge 1973: 230 ff), were the result of a purely inductive treatment (see for example Fritz & Plog 1970: 409 f and Watson et.al. 1971: 9 ff). They can, therefore, according to epistemological principles, not be considered generally applicable in the then given form, since they are not tested. Concerning Iron Age agrarian settlement, the continued discussion (JBV beginning with section 3) may be considered as a positive verification of the posed hypothesis. Concerning the graves in the inland lake environment, investigations in Haverö may be interpreted as a negative result of a test on the posed hypothesis (Baudou 1977: 104 ff and 1978: 2 ff). The pure archaeological-topographical part of this hypothesis has proven to have a high degree of predictability (see for example Watson et al. 1971: 5, Hill 1972: 83) at the continued surveyings of the inland (see maps in Selinge 1976), and from a spatial and macroecological point of view it, therefore, ought to be considered as verified. Concerning the coastal environment no further investigations worth mentioning have taken place, which explains why the source situation there is fairly unchanged.

A continued general treatment of the material according to the established directive rules may, therefore, be considered justified. A certain methodological new orientation is, however, desirable even in a general context, in any case if the investigation, above a purely descriptive presentation of data, shall also seek explanations for the underlying cultural development. Without trying to use technically advanced methods, I have chosen partially to try to establish a systems-theoretical view of the material and partially to try to interpret it - to a certain degree in an intended methodological contrast to the treatment in JBV - with a point of departure, in principle

in an adaptive and behavioural attitude towards the prehistoric cultural contexts (Clarke 1968: 43 ff, Watson et.al. 1971: 63 ff, Binford 1972: 135 ff and 195 ff, Redman 1973: 16 ff). These aims involve a methodical effort to work with different kinds of sources of cultural development and to try to evaluate their validity for illustrating different cultural categories, for example in economical, social and ideal respects. A hypothetical point of departure, in this case, is also that different categories of sources are able to illustrate not only different aspects of a cultural state but, also, that they may be structured in different combinations to different cultural varieties (compare Hagen 1970: 124 f). The first task is to examine if and how the source material may be related to such principle approaches and ideas. Because of the complex character of the source material in question, that necessitates a brief discussion about archaeological sources in general.

3.1 THE SOURCES - STRUCTURE AND SYSTEM

It has already been pointed out (JBV: 160), that ancient monuments and prehistoric artefacts, from a source critical and methodological point of view do not afford any crucial differences, and that can even be applied to other archaeological source categories as, for example, closed finds (compare Moberg 1969: 44). From a settlement archaeological point of view, on the other hand, ancient monuments have in many cases a higher "source potential" (Gräslund 1974: 12) than large portions of the find material, since they have consistently preserved the chorological relation to the prehistoric context. The latter also constitute an integrating part of the source material - and that not the least important - even if the preservation situations may differ for that and the pure archaeological sources.

Clarke (1968: 84 ff) has depicted a socio-cultural system as a static and dynamic model with a number of arbitrary variables - called subsystems - which are held together by an environmental framework. The choice of and connection between these variables may be discussed (compare Stjernqvist 1971: 24 f and Welinder 1975: 20 f), but that is of lesser importance in this context. If one imagines the dynamic model (Clarke 1968: Fig. 14) "cut off" at a certain point in time - for example because a community quickly dies out - the remains of that cultural system rather quickly will build a fossilized pattern in the environment which, of course, still is developing. A partial example is what happened with a part of the religious and social subsystems when heathen burials ceased upon the entrance of Christianity. Other subsystems - for example those of economy and subsistence - then

continued probably unchanged but may have been changed or discontinued at other points of time and because of other reasons. Fossil or relique patterns in the sections of the dynamic model of a cultural system constitute, accordingly, a representation of the specific archaeological sources to the description and the investigation of the system. For archaeological sources essentially always consist of abandoned cultural manifestations (Selinge et al. 1976: 8). It might be a pure exception that these sources - as were here presupposed - have appeared because a whole cultural system has been "cut off" all at once . On the contrary, the cultural remains are, as a rule, not contemporary and constitute a complex pattern which only to a greater or lesser part has been preserved in its original context. This has, too, often been changed by later development. As well as the living culture may be presented as a model of a dymanic system, can however its material, fossil or relique remains be illustrated in a model which is principally of a static character. In this model, then, the living cultural subsystems - for example according to Clarke's model - are replaced by the archaeological sources, presented as subsystems in an archaeological source system of static character. To search for connections, demonstrate relationships, causes and effects, to quantify, analyze and study components in that system is an essential part of the archaeological source criticism's tasks.

Historical, cultural historical and archaeological sources may, among others, be seen as a contact or communication system between the past cultural totality - whether one regards this as sequences of events (Moberg 1969: 56 f) or as a multi-variable process (Binford 1972: 199) - and the later observer or researcher. The interpretation of the sources' message is never unbiased in the receiver's situation (Johansen 1974: 24 ff), but it may be of interest to see the sources' prerequisites as a message also from the sender's situation. Such a way of reasoning is not usual in archaeology but, on the other hand, highly characteristic for the historical, source critical method (Torstendahl 1971: 73 ff). Compared to the disparagement of historical theory and method, which has appeared within certain anthropologically oriented circles within modern archaeology (for example Rouse 1972:4), one has also maintained that archaeological and historical theory and method stand, or ought to stand, considerably nearer each other (Trigger 1973). An analogy to the historical way of considering the source material may, in any case, therefore be worth trying even on the archaeological sources.

All archaeological sources are in historical terminology always remains (Sw. *kvarlevor*), that is to say, remains of events, processes or contexts,

in which they once were included in a living culture (Torstendahl 1971: 80 ff, Malmer 1963: 12 ff). They mirror, therefore, the cultural, social, and economical structures, which have steered these cultural courses of events or developments (Selinge et al. 1976: 10 f). The normal situation ought to be that one tries to interpret the sources' function in these cultural contexts in principle in the same way as a historian uses a source as remains. Written sources include, however - in addition to their character as remains - usually also their own statements about contexts and events. It is in the interpretation of these statements that specific historical source criticism is applied. In that real meaning historical sources are lacking in Scandinavian archaeology (with the exception of certain rune stones and some information, used to boredom, from classical authors). What one, on the other hand, usually has disregarded is that many archaeological sources - but far from all - in similarity with historical statements have a contents of ideas, evaluations, thought patterns, points of view and perhaps even feelings and opinions. The one who has left the monument or object, which is used as an archaeological source, has accordingly by that wanted to transmit a conscious message to posterity. The source is, in other words, similar to many historical ones of that kind, tendentious (Torstendahl 1971: 94 f). It ought, therefore, to be subjected to source criticism (compare Malmer 1963: 13 f).

The systems model over the archaeological sources (Fig. 3) that is presented here gives the traditional division into prehistoric objects and ancient monuments, which is important, among others, from a settlement archaeological view. In addition it, however, describes the here sketched difference in tendencies or idea contents concerning the latter sources - considered as messages to posterity. Even among the objects can probably such a difference exist, but as it has little importance from the current investigation's point of view it is not noticed here. It has probably also rather had the character of a message to its contemporaries in the form of social signals. The three main groups of archaeological sources are then objects, ideal remains and functional remains. The first group does not need to be commented further in this context. It includes both finished artefacts, raw material and production and use wastes (compare Meschke 1977:28). The here intended difference in historic tendency between archaeological sources has previously been discussed by, among others, Eggers (1959: 264 ff) concerning the subjective respective objective choice in the combination of objects in grave, treasure and dwelling site finds.

The functional remains have, at one time, been formed in order to cover general human needs and fill economic and social functions which, to a great degree, are common for man during all times. When, therefore, the antiquarian judgement of their kind and type (Selinge 1974: 11) are carried out, they invite no fundamentally - although often in details - difficult interpretational relationships. They always represent a solution of a practical problem. The underlying "cultural category" (Taylor 1948:122) is then usually directly understandable. They have a typical behavioural character and may be seen as a result of an adaptive action during the human ecological and social surrounding's influence. They mirror, in that way, a category in the prehistoric culture, which in modern archaeology has been emphasized as important (for example, Binford 1972: 237, Hill 1972: 75, Spaulding 1973: 245). In Clarke's terms (1968: 102 ff) they lie within the subsystems for economic and material culture (by the way an incommensurable term) and partially within social culture. In Stjernqvist's model (1971: 47) these sources lie within the framework for influences both from material and social environments, though the first mentioned, as a rule, is the basic. To these sources belong above all remains from habitations and dwelling sites, structures for areal ways of livelihood as fields and fences, structures for extensive livelihood industries as hunting facilities, structures for production as workshop sites, fortification structures and structures for communication. The functional character means, consequently, that those in a historical meaning make up a pure remain without expressed tendency (compare Hyenstrand 1978B:62).

The ideal remains are, on the other hand, tendentious - that is to say normative - in the sense that, for example, religious and social values, irrational conventions, magical thought patterns or witchcraft may have been decisive for their creation or added to their formation. They then belong to the religious and social subsystems in Clarke's model. Kind and type definition of these sources is not usually difficult, since they, as a rule, are built with the purpose of being visable for the future and conventionally formed within large areas, but the source critical interpretations of the underlying cultural categories may afford great problems. These categories are available only through conclusions and hypotheses based on the sources (Taylor 1948: 122 f). Difficulties of interpretation are grounded, among others, in the fact that the prehistoric society's norms and ideas stand far from our own, while the functional sources' character of practical problem solving is principally similar then as now. Because the normative contents

of these sources one does not, however, need to draw the conclusion that the whole of the prehistoric culture has a normative character (compare for example Binford 1972: 195 ff, Watson et al. 1971: 61 ff). I consider it, in general, most probable that the normal situation both for a prehistoric and for every other culture is that they have tendencies of both a behavioural and a normative nature. It is then the normative characteristic of these sources which involve their above named tendency. One must clearly understand that this intentionally may have directed both their formation and their occurrence. To clarify selections and tendencies in these sources - for example concerning spatial relationships, dimensional relationships, environment, etc. - are, because of their quantity, an important task for archaeological source criticism.

A further division of these sources may result in two large main groups. One can be termed "monumental" - in the word's original, literal meaning - or memorial. To this belongs then, in the first place, the large number of prehistoric graves, grave constructions and cemeteries and, in addition, a couple of smaller groups - foremost runic inscriptions. The other group may be named ritual or ceremonial, since the creation and/or use of these remains with greatest probability have, as a main purpose, been attached to rites or ceremonies. Rites can have included both the production and use of the constructions. To this group belong chiefly carvings and paintings on rock and stone but also, among others, natural objects to which ancient customary usage has been tied. That ceremonies secondarily can have been tied also to other constructions - not least memorial ones - is a pure truism, but this particular group has rites as a primary or, probably, as the only purpose.

From a general, settlement historical point of view the memorial graves are, for quantitative reasons, the most important group for the time periods and cultural forms, where constructions of monumental graves were included in the cultural pattern. That means, consequently, that one primarily ideal source is used as evidence of a functional cultural manifestation, that is to say settlement. Empirically this procedure may, in general, be judged both suitable, reasonable and inevitable, but one ought, however, to remember the ideal sources' limitations from the viewpoints presented here. Selections based on social relationships, religious ideas or burial tradition can, for example, appear in the "memorializing" of the prehistoric population, which the graves constitute. The "national registration" which one with reason can

assert that the grave number represents (Hyenstrand 1978: 71) is then primarily not a registration of people but of ideas.

In the model find categories are included, which make up combinations of these three main groups. Closed finds are, for the most part, combinations of objects and ideal remains - or, as a rule, rather combinations of objects which in one context were put down in an ideal remain (Moberg 1969: 50 f). The large mass of these consists of single burials. Accumulated finds, in the same way, in general make up a combination of objects and functional remains - that is to say objects and/or cultural waste, which was accumulated in or near functional constructions of the above named type (Moberg 1969: 53 f). Now the find accumulation is often the only visable element - in any case upon ocular inspection - of these locations. A third group represents, finally, combinative sites, where both ideal and functional remains and usually also objects are represented. Quantitatively - and above all from a settlement historical point of view - these groups constitute the large and important sources which, in the model, are illustrated by an exterior cycle. An archeaological reworking may, in principle, begin anywhere in that revolution - depending upon the researchers' point of origin, sources and upon the posed hypotheses - and from there move on to other sources within that. A traditional artefact centered investigation may then begin with objects, a settlement archaeological intensive investigation with, for example, a combinative site and a general such investigation with a group ideal or functional remains - for example graves or dwelling sites.

For the sake of completeness, however, several completions of the model are needed. Megalith graves include, for example, cumulative depositions of the dead in grave chambers - that is to say, an accumulation in an ideal remain. Cumulatively deposited finds - for example the large offer finds from the Iron Age - are an in principle whole homogenous example, even if a construction should be missing. The direct contrasting case - that is a closed find in a functional construction - exists, for example, when a hidden treasure was deposited in a house foundation. These sources are collected in the centrally placed square "deposits" - the term here taken in a general, wide meaning. Certain of these consist solely of objects in closed or accumulated combinations. From a settlement historical point of view one can, within the area in question, ignore these categories but in the archaeological source system as a whole they make up an important part.

The model of the archaeological sources gives a visual impression of being a closed system but that depends only upon its incompleteness. The system is in reality open in at least three respects (concerning open and closed systems see Norrbom 1973: 44 f). The first of these concerns the prehistoric context. As mentioned above the source material still, to a large part, remains within this - at least in a pure spatial sense. That has been illustrated in the model through the environmental framework, within which almost the whole system is included. That the objects to a lesser part lie outside of the framework marks that such ones without known context or find place may, in spite of this, have a limited source value - for example from a typological point of view. The find environment in a wide sense is a part of the source material and, generally, it can be divided into habitat and biome - that is to say, in large, geographical/geological and biological environmental factors or inorganic respectively organic environment (Clark 1957: 175, 1975: 33, compare Selinge et al. 1976: 9). These geodata and biodata can, in addition, often be completed by or include traces of physical or chemical nature.

The system is, however, open also in time. As long as prehistoric times lasted - or the delimitation in time one otherwise will draw for one's research activity - an input of new source material successively took place. More important from a source critical point of view is, however, the limitations and changes which have taken place both during that time and afterwards through wastes of source material - one in a lower or higher rate continuing output both of remains, objects and environmental factors. In that way the quantity of these has not only decreased but also the relations between them have been changed. To attack and interpret these relationships also belongs to the tasks of the archaeological source criticism.

The system is, lastly, also open in the research situation. Only registered and observed data are available for research at a certain given time. As Johansen pointed out (1974: 45 ff) the collecting situation is "unlimitedly complex" and only the described, known part of the source material exists for research in practical, real meaning. Description is, in addition, dependent upon "the definite situation of origin I seę for the object which is described" (Johansen 1974: 47). The source material is expanded and changed, then, not only through new discoveries but also through new descriptions, classifications, re-evaluations and analyses (compare Hyenstrand 1975: 84 f). It may be, of course, also quantitatively reduced through these processes but even such an output means an input of knowledge. For the regional research

area, important here, a large quantitative input has taken place during the last two decades but a large input of knowledge in the system might remain to be won through a more thorough reworking of the material. The system's development may be illustrated in a simple flow model (Fig. 4). As an example of a source material which can be used, among others, for hypothesis tests and in an explanatory purpose, an analogy is also included in the model in the form of the cultural development within the same area during historical times. That has been noted as one of two relevant analogical situations (Binford 1972: 36, compare Stjernqvist 1971: 53). The other is assigned to the human ecological environment and the adaption to it.

3.2 THE METHOD - SYSTEMS AND MODELS

The three earlier defined ancient monument complexes (Selinge 1973) were determined in the first place by the ancient monuments' environmental habitat, in the second place by the remains' chorology and morphology and, lastly, in consideration to the chronological factors. The first three variables are included in the above described source system. If one regards each of the three ancient monument complexes as remains of a real human ecological system, these source variables may, in the research situation, be seen as steering units of this system (Norrbom 1973: 66 ff). This is valid, in the first place, for the descriptive, symbolic systems that are created in the research situation in question, which is determined by the interpreted sources. One can, in similarity with Johansen (1974: 45 ff), maintain that the systems really exist only in the described form, but that is more of a pure philosophical question (compare Norrbom 1973: 38 f). That the cultural development as such, in reality, for the most part is steered by other variables may be taken for granted, since the sources produced by man hardly simultaneously can be both steering means for and consequences of the cultural development. The only way to get knowledge about these basic steering factors goes, however, by way of the sources, and since these are decisive for the research situation the distinction between a symbolic and a real system has hardly any greater practical significance. One might come closer to the truth if one says that the archaeological remains are products - that is effect variables - of the real system, but steering means - that is influencing variables - for the symbolic system in a research situation (Bergström 1973: 52). The systems' function is, among others, to be "a way of seeing things in order to understand reality" and "a tool and language in order to describe reality" (Norrbom 1973: 14 f). The real basic steering factors can first be discussed in a conclusive, explanative reasoning.

In the systems theory concerning cultural relationships lies a conception about the interaction between stabilizing and modifying factors (Clarke 1968: 175 ff). The cultural system reacts in a stabilizing direction at short sight, since it has possibilities of counteracting changes by inputs with arrangements and reactions in other parts of the system in the intention of preserving a reached equilibrium. "Social systems represent highly complex arrangements which persist because of the ability of the different elements of the system to react to changes in individual elements or in the environmental input in such a way as to maintain the organization of the system as a whole" (Sherratt 1972: 482). Taking a long view, however, the systems can describe trajectories in certain directions through their repeated reactions to sequences of changing stimuli (Sherratt 1972: 483 f, Clark 1975: 25). A systems theoretical reasoning may, consequently, be used in order to describe both situations and trends which is an important prerequisite in this context.

The three human ecological systems in the Ljungan Valley are purely empirically based by the direction of repeated, added observations of evidences in the terrain, on maps and in descriptions of single locations. Before the formulation of the hypotheses, then, there was an inductively emerged, rather diffuse theory on "the situation of origin" (Johansen 1974: 24 ff). Such a subjective view makes up both a prerequisite and a limitation for the archaeologist's work: "Without an idea of which actions prehistoric man had made and where he had made them, he would not manage to define what the traces of these actions should look like and where they should be found. But at t e same time that idea of prehistoric circumstances would set a limit for which data he would be able to see and in which way he could deal with these data" (Johansen 1974: 35). Such an empirical, successively emerged and modified idea lies behind and is developed during the collecting situation itself - not least in the surveying of ancient monuments. The systematization of sources and ancient monument environments and the proposal of hypotheses from these make an attempt to rationalize, describe, complete, change and, if possible, explain this view of prehistoric human behaviour. In the indication of the human ecological point of view lies an emphasis on the real culture systems' adaptive and behavioural character. "... one of the major aims of archaeology must be to correlate the structure of material remains with the behavioral elements of a cultural system" (Watson et al. 1971: 63). The concept cultural adaptation is in sociologically oriented archaeology a main idea - often together with systems theory - but one has simultaneously emphasized the need for a limitation towards natural-determin-

istic or biological evolutionistic ways of thinking (Hagen 1972: 7, Burnham 1973, Trigger 1973: 102). I have the intention to mainly use this concept as an alternative to the, to date, applied explanative models for Norrland's prehistory. It excludes, then, both a pure nature-determinism and a purely normative view of culture and accentuates the reciprocal in the relationship (compare Hagen 1972: 7).

It ought to be stressed that an ecological/adaptive point of view is by no means an innovation in Scandinavian archaeology. Such a basic view was maintained at an early date, above all by A.W. Brøgger (Gjessing 1951: 216, Hagen 1970: 149), but has, after that time, remained in the background advantageous to a research tradition centered on artefacts and with chronological basic aims (compare Gjessing 1951: 217 f, Selinge 1978 B: 76). The ecological and social environmental factors have nowadays been summarized under the concept of cultural ecology (Hagen 1970), which may be said to be somewhat broader than the term human ecology used here. It represents namely the relationship to and the dependence on the environment not only for the biological species of man but for the total social/economical culture systems. (Concerning the concept ecology within archaeology in general see, for instance, Hagen 1972: 3). Since an archaeological or social anthropological study always works with man as a cultural being there are, however, no practical differences prevailing between those concepts. That such a paradigm here has been put into focus is partially grounded in a new research situation with partly new principal views - not least on the cultural landscape as a basis for research (compare Selinge et al. 1976: 9 ff) - and partially empirically determined (Selinge 1978 B: 78 f, Hyenstrand 1978: 71 ff). "But if we accept that man both determines and is determined by his environments, we are obliged to realize that an archaeological material may be evaluated as *assembled complexes* and together with the ecological factors, when the goal is to work with *cultures and not only cultural products*" (Hagen 1970: 150, italics his).

The method and division of the source material is seen in the model Fig. 5. In the column source variables the systematized sources in the preceeding section have been registered and divided into two stages for one subsistence model and one social model. It lies in the applied human ecological point of view that the first named is basic. It is implied that the functional sources, in principle, are most important for the former model but the graves are even here of great importance as indirect settlement indications - foremost from a spatial and quantitative point of view, in which respects they, in two of

the systems, are the main sources. A third model is built upon the chronological variations of the source material in the intention to investigate the prerequisites for a cultural-processual model. A reasonable and relevant explanation of such a model is to be taken as a final goal. By culture process one means, in the school of new archaeology, "dynamic relationships operative among cultural systems", and one rejects the periodicity involved in a usual chronological ordinal scale, mainly because such a scale is not explanative but only empirically cumulative (Binford 1972: 87 f). It has also been suggested that a traditional division into periods in connection with a more anthropological direction shall be replaced by a chronological flow (Plog 1973). The six stages listed in the model concern, however, in the first hand a presentation of the source material's main data at different times, since those constitute the prerequisites also for an explanative hypothesis. "The ability to study change" depends primarily on "the ability to study situations, states; to see how far these situations are similar or different" (Moberg 1975: 362). A formulation and eventual testing of an explanatory hypothesis - or several alternative hypotheses - are dependent of these differences' nature, degree and comprehension. It has recently been pointed out (Hyenstrand 1978 B: 62) that a source material of this character, in any case, is suitable in order to "in time and spatial dimensions read off position-determined functions and processes". In order to throw light on the last stage, which was included for the sake of historical continuity, that in my opinion is important, a couple of non-archaeological sources also shall be used.

In the central part of the diagram a methodical sequence for each of the three human ecological systems is shown. The sources' appearance is shown in the form of a simple trait list for each system, where x indicates an appearance of important or decisive extent and (x) indicates an appearance of nearly negligible extent or in today's research situation doubtful but possible appearance. The two first models have no chronological relevance. The arrows mark, therefore, only the direction of the investigation and not the dynamic systems' trajectory. From each model level may, naturally, also feedbacks to the earlier treated investigation levels normally appear, even though that is not marked. The appearances will be spatially and quantitatively decided within each system. The presentation is relatively brief and for the agricultural system it receives, principally, the form of references to JBV.

To account for "content, structure and range" of a regional, cultural system, together with its ecological relations, is considered within new archaeology to be a suitable task for a regional investigation, and it is emphasized that the region is of suitable size from a systems theoretical point of view (Binford 1972: 135 ff). Even the ecological viewpoint's near relation to this regional approach has been emphasized (Watson et al. 1971: 91 ff). The Ljungan Valley - or any Norrlandic river valley - may therefore, according to these demands, be seen as a suitable object for a regional investigation. The river basins have often their densely settled areas centered to the river valley itself, while the areas around the watersheds, as a rule, are poor both in ancient monuments and later settlement. They also coincide, because of this historical development, often with later boundaries (Janson 1965: 340).The Ljungan Valley has, in spite of its inconsiderable scope, representatives for nearly all types of ancient monuments, combinations of ancient monuments and ancient monument environments in Norrland, and it is centrally located within this extensive part of the country - especially with consideration of possible communication routes from the S and W. The approximate, empirically determined distribution within the region of these three complexes of ancient monuments is seen in the fundamental sketch Fig. 6. The three systems may also be presented in a simple model, where the real or possible relations, which are known in the empirical view, are illustrated, partially between the systems and partially outwards or inwards, away or towards the region (Fig. 7). Light will successively be cast upon the nature of these relationships.

One may, of course, also out of the latter viewpoint see the whole region as one system of more superior character. This picture is completely normal for the systems' hierarchial structure (Norrbom 1973: 23 ff), which can be illustrated in an "analysis cone" (Fig. 8). This may have as many levels as seems subjectively suitable for a certain investigation. One may, for example, see level A in the figure as the whole of Norrland with each river valley - or with an alternative division, for example one province - as a partial system on level B. Level C then becomes the subsystems of the character that was sketched above or after other suitable divisions - for example administrative. If one, on the other hand, makes the level A represent the region on the river valley scale, then B becomes the subsystems in the above sketched type and C may then represent components in these - for example of the functional character as Clarke gives for his subsystems (1968: 125). Clarke has, moreover, later (1977: 12) sketched a hierarchial system on three levels which, in principle, agrees with the analysis cone.

With that point of origin, which is chosen here to begin with, the human ecological complexes within the river valley form the system's level, and the region/river valley forms a super-system, but these levels may, however, be changed according to need. The main importance is placed on the relations between the components and the systems, and the systems are open - partially towards the natural surroundings and partially towards the surrounding systems on different levels (Watson et al. 1971: 59 ff).

4. Subsistence models

The model levels shall, henceforth, be handled in the model's direction and the systems within the same from left to right.

4.1 HUNTING AND GATHERING SYSTEM

It is not my intention here in detail to deal with the river valley's Stone Age from the viewpoint of artefacts nor to investigate the hunting culture's social and economical functions - that is to say, to carry out a fundamental site analysis of the distribution and amount of material within the Stone Age sites along with their stratigraphical and spatial relationships. That should require many more investigated dwelling sites. An analysis of a great part of the known find and dwelling site material in the river valley is under publication of another author (Sundlin). The main purpose is here instead, with the point of origin in the source material's grouping in large and with regard to the fundamental human ecological and social factors, to try to throw light on the hunting culture as a local background to the agrarian cultural form, established during the Iron Age. The treatment of the coastal environment in chapter 4.2 has the same main purpose. Of special methodological importance is the fact that the ancient monument material for the hunting environment of the interior is mainly of a functional character, to which may be added stray finds of artefacts, while the other culture complexes' main sources lie within the ideal category.

The source situation for the Stone Age is intimately dependent upon the above sketched surveying situation concerning the dwelling sites. Before the occurrence of or lack of dwelling sites within areas with different degrees of surveying is discussed, the general human ecological prerequisites for the dwelling site area shall be dealt with.

4.1.1 Environmental factors

The dwelling sites known to date lie almost without exception within the area above the highest coastline, which cuts the main valley at approximately 240 meters above SL just below the parish border between Haverö and Borgsjö (above 2.1 and Fig. 1). The river valley's physical prerequisites for dwelling

site localization has been described above (2.2). Suitable cultivation soil is of inconsiderable proportion here and is found mainly on smaller glacial lacustrine sediments where, because of this, the spaciously distributed modern villages are located. Stone Age dwelling sites are located along the water courses and are based on other evaluations of the environment. A couple of factors ought here to have been of especially great importance. Partially, it may be expected that one has taken into consideration the location's general suitability for residence and settlement, which probably mainly has been temporary. Partially, and above all, it is the conditions for exploiting the natural eco-system as a basis for subsistence which has been decisive. The localization of dwelling sites must generally afford important directions about the prehistoric use of the environment's resources (Clark 1975:19 and 30), even though the possibility for later changes of the environment must be noticed. "The ecological approach is primarily an investigation of how the settlement pattern reflects the adaptation of a society and its technology to its environment" (Trigger 1967:54).

The usability of the dwelling sites' localization for determination of the Stone Age culture's habitat is greatest within the above mentioned, similarly surveyed area of the main river (2.3). This also includes the most dense concentrations of dwelling sites, located at the similarly shaped lake systems Fotingen-Lännässjön-Klövsjön (437 meters above SL), Hålen-Äldern-Nästelsjön (352-354 meters above SL) and Rätansjön (349 meters above SL). The glacial lacustrine and glacio-fluvial deposits of gravel, sand and fine sand (Lundqvist 1969: S middle sheet), which surround these lakes, involve that the shores often are made up of flat and self-draining dry pine woodlands with eroded steep bank scarps and pronounced sandy beaches. The dwelling sites are, therefore, easy to locate, which may have contributed to the present frequency, but the shores must also have been easily accessible for mobile hunting men and offered favourable conditions for residence. One can, within these lake systems,see that the frequency of dwelling sites decline along the shores with a different geological basis - for example moraine clay shores at Hålen and hard moraine with areas of rock near Fotingen. The exposure of the beaches is also of clear importance - above all along Klövsjön-Lännässjön, where the shady steep W shore below the ridge of the Klövsjö mountains is much poorer in dwelling sites than the E shore, which is exposed towards W-SW(Fig. 20). The detailed localization of the dwelling sites are often influenced by the local topography with concentrations near inflows and outflows in the lakes, near points and capes along with straits and islets. This is, for example, clear near the straits between Lännässjön and Klövsjön,

at Lake Äldern, on the promontory in Nästelsjön's E part and between Ljungan's inflow and outflow in Rätansjön (compare Fig. 20 and Selinge 1976: Fig. 14). The most reasonable explanation to this is that fishing has had a decisive importance for residence. Even for hunting and trapping may, however, these locations probably have been suitable, among others in relation to the big game's passage of the water courses. I see, therefore, the localization of dwelling sites as a function in the first place of the environment's game and fishing biotopical prerequisites and in the second place of the general accessibility of the shores.

Many examples of dwelling sites are found even along less accessible shores (compare Selinge 1978: 3.2). Within the course upstream the above treated lakes stony, partially rocky beaches or grass overgrown and hardly surveyed low beaches are found in Ljungan, for example along Gruckensjöarna respectively Börtnansjöarna. Even on these beaches, however, dwelling sites are found - among others on plateaus inside very course boulder beaches near Gruckensjöarna. In such localizations I judge that the subsistence economical prerequisites have been more important than the beaches' character. The probability for undiscovered dwelling sites is, in addition, greater in these difficultly surveyed locations. Even shifting prerequisites in the dwelling sites' real function - that is to say, the nature of the activity which was carried on there - is naturally of importance in the choice of the place of residence (compare Gräslund 1974 B: 6).

The chances of finding traces after prehistoric hunting men in other situations than along the water courses in Norrland are, in the inland, very small because of the slight cultivation and the predominant forest vegetation. That other areas were exploited - above all for hunting - may, however, be taken for granted. Single stray finds may be interpreted in that direction even if information on these, as a rule, are incomplete. Of principal importance was, therefore, the discovery in 1974 of some small dwelling sites in the wind eroded bare mountain region in the edge of Ljungan's river basin near the S end of the pronounced passes through the Lunndörren Mountains (Selinge 1976: 33 f). Extensive dwelling site complexes of partially very great age have long been known in similar terrain locations in Norwegian areas (Clark 1975: 204 ff with op.cit., Indrelid 1977: 132 ff). This is why systematical investigations in the bare mountain terrain above the treeline even in Sweden probably should give results. Even if the total dwelling site frequency, consequently, may be moderately incompletely known, however, one may count on it being the same groups who left traces both in the mountains

and along the nearby water courses. The dwelling sites near the latter can, therefore, give an ecologically incomplete but quantitatively representative view of the hunting culture's activities within the area - taking it for granted that the surveying is somewhat similarly carried out.

Of great ecological importance is also the post-glacial climatic development and vegetation history (Lundqvist 1969: 179 ff, Engelmark 1978 B, compare Baudou 1977: 34 ff). A relatively warm climate has prevailed already during the deglaciation stage during the Boreal period, but the real warm period culminates during the late Atlantic period around 4 000 B.C. and lasts until the end of the Sub-Boreal period around 500 B.C. (Lundqvist 1969: 182, Engelmark 1978: 43). The development is paleo-botanically well documented, among others in a bog near the upper Ljungan Valley (Lundqvist 1969:334 f) and now also in a couple of bogs in Haverö (Engelmark 1978: 31 ff). The Atlantic period is characterized by a decline in the pine forests and dominance of deciduous trees - here above all birch - while the Sub-Boreal period has more of a dominance in pine in a drier climate. Its conclusion during the transition to the Sub-Atlantic period is signaled by the entering spruce curve. An important human ecological consequence for the upper Ljungan Valley - not least for sites of the latter discussed location - is the higher situated treeline during the warmer period (Lundqvist 1969: 186 f, compare Clark 1975: 234).

With minor variations can a climate, similar to that of the present, have existed after the decline at the end of the Bronze Age. The inner parts of the river valley have, at present, a relatively continentally accentuated climate in the shadow of the Norwegian high mountains with considerably lower winter temperatures, partially lower summer temperatures, fewer number of sunlight hours, longer winters and shorter vegetation periods than the coastal land (Rudberg 1962: 50 ff, Atlas över Sverige 25-34). Expressed in natural-geographical terms, the area with reliably recorded Stone Age dwelling sites is located within the region of the large lake chains, moraine hilly land and the large bogs along with the supra-aquatic stratifications' area (Lundqvist 1943: 151 ff), although the valley's spatial limitation is such that none of these characteristics becomes especially pronounced.

4.1.2 Dwelling sites

Within the Ljungan Valley there are, to date, about 260 dwelling sites registered in the Central Office's Register of Ancient Monuments. In comparison to the richest Norrlandic river valley - that of Ångermanälven - where about 1800 dwelling sites are known, this is a low number (compare Selinge 1978: 3.2). Within the most dense area of the Ljungan Valley, however, the distribution is completely comparable to that within other river valleys, and the low total number depends partially upon the valley's limited extensions and partially upon the modest extent of the completely surveyed area for dwelling sites (Fig. 2). The distribution is shown on the map, Fig. 9, where the frequency is given in a geometric scale for each Economic Map sheet, that is to say for 25 km^2.

The number of dwelling sites may be judged as representative within the Rätan-Klövsjö area upstream from the province border towards Medelpad, where the shores, to the greater part, were normally reachable during the survey of ancient monuments in the 1970's and where the number of previously known dwelling sites was then greatly increased. Nearby, downstream from this border to the highest coastline - that is to say within Haverö parish - no systematical surveying of dwelling sites was made in connection with the survey of ancient monuments. Havern lake system is almost completely unsurveyed concerning dwelling sites and the larger Holmsjön was only worked through at an earlier regulation surveying. Probably, therefore, a new surveying should here reveal important additions. Within the upper part of the valley surveying for dwelling sites of the large Flåsjö magazine was completely impossible and surveying of Storsjön was great made difficult during the survey of ancient monuments in 1974. Even here should, therefore, a new survey under more favourable conditions have brought with it considerable additions. Gimån's water system is completely unsurveyed upstream from the province border and destroyed by damming downstream from this after an early, highly summarized survey. Both the formation of the terrain and other occurence of ancient monuments indicates that at least the area within Jämtland ought to be rich in dwelling sites (Selinge 1976: 36 and 44). Downstream from the highest coastline almost no dwelling sites have been found, in spite of the fact that conditions are suitable and certain parts have been surveyed (Baudou 1977: 105). For a spatial and quantitative analysis of the number of dwelling sites, therefore, today in principle only the densely evidenced Rätan-Klövsjö area is usable.

Only a few dwelling sites are excavated - partly in Storsjön, Lower Grucken, Skålsjön, and Rätansjön (Sundlin site numbers Storsjö 4, Åsarna 28, Klövsjö 21-23 and Rätan 55 and 145) and partly in Holmsjön (Baudou 1977: 106 ff and 1978: 10 ff through K Hjortzberg). For the investigations' results, the above named reports are referred to.

The term dwelling site has, in this context, a purely operative meaning - that is to say, that a dwelling site constitutes the hunting culture's spatially treated unit. Meschke (1977: 27 ff) has discussed the concept dwelling site and tried to relate the surveyed dwelling site to the functional, original unit, which consituted a residence during a human ecological and social situation, limited in time. In adherence to Malmer (1962: 256) he makes a difference in qualitative and quantitative elements. I share his understanding in the first case, that dwelling sites are determined partially by raw material, partially by wrought material and partially by rubbish and that the last mentioned factor - above all in the form of cracked stone - is the most important indication of the hunting culture's dwelling sites in Norrland. In the source system, according to 3.1 above, the dwelling sites are consequently typical find accumulations, which only exceptionally have intrusions of visible functional structures - in any case at surveying. On the other hand, I do not agree "that cracked stone alone is not found outside the dwelling sites" (Meschke 1977: 30). For cracked stone may appear in secondary locations or may, in certain cases, have recent origin without that being definitely possible to determine. In judging these appearances there is a quite necessary empirical element (compare Selinge 1978: 3.1), but in relation to the greater number of dwelling sites, these uncertain exceptions have little importance.

Meschke has discussed the quantitative criterium (1977: 30 ff) only concerning the extension of the dwelling sites - that is to say, the length along the beach - however not in relation to the amount of registered material per surface unit or length unit. During surveying the distance of 50 m between registered appearances constitutes the norm - rather for the sake of registration technique. Meschke regards this distance as being too short and choses to arbitrarily regroup his material to a minimum distance of 150 m. The one-quarter of the number which has an extension of more than 150 m he terms, instead, "agglomeration of dwelling sites". The motivation for this is that "these elongated sites were probably formed by repeated sojourns". In an unstratified find accumulation we have, however, no possibility of discerning what is the result of one continual or one with longer or shorter intervals

between repeated residence, if the artefact material and other finds have a homogeneous character. It might now be agreed upon that the hunting culture of Norrland, like the majority of other hunting and gathering cultures, have had a mobile character and that these movable social units have consisted of relatively small groups of people (Lee & DeVore 1969: 11 f, Gräslund 1974 B: 4 ff and op.cit.). If we presuppose seasonal variations in the exploitation of the environment, probably the today preserved remains of only one such sojourn - of perhaps some month's duration - are modestly extended. Consequently - with the prerequisite of similar conditions of preservation - the quantity of observable material on a dwelling site should, to an equally high degree as the dwelling site's extension, be a measure of the number of sojourns at the dwelling site (compare Indrelid 1977: 132 ff). Both amount and extension usually grows - in principle in an unforeseen way - during excavation (Meschke 1977: 30), but even the opposite appears. In addition, dwelling sites of different size, at least theoretically, might have had different functions in the social and economical environment (Gräslund 1974 B: 6). The conclusion must be that a surveyed dwelling site of tentatively 20-30 m length from a functional point of view may equally well as a dwelling site of 150 m length be an "agglomeration of dwelling sites". There is, therefore, neither reason nor possibility to regroup the empirically surveyed material with only the length as a point of origin in order to come closer to the original functional unit.

The operative concept dwelling site may, therefore, during surveying and excavation of an inland lake in Norrland, from a source critical point of view, have at least three meanings. The primary one is the accumulation of cultural wastes which is the result of one single continuous sojourn - that is to say, what is often called a "pure" dwelling site (Indrelid 1977: 133 f). The second point is that normally, however, several similar sojourns have taken place on the same site. In spite of that, the spatial extension - which may depend upon topographical factors and the like - does not need to be larger, and the traces from the sojourns may not be separated even through excavation. The third point considers that several such concentrations, which originally have been separated in the plane, secondarily, through find distribution etc., have become connected and appear as one registered dwelling site. Both of the latter variations may in some different ways be considered as "agglomerations".

Shorter dwelling sites are measured during surveying through pacing, while the extension of the longer ones are usually determined through measuring

after insertion on the photographic map. The length of the registered dwelling sites with a given length of extension in the Rätan-Klövsjö area is illustrated in the diagram, Fig. 10. Possibly, the shortest of the sites, up to a length of 30 m, may be thought to mirror a functional dwelling site size but they correspond, however, to only 11 % of the dwelling sites. Moreover, the length distribution seems to successively decline upwards with arbitrary variations, where the modestly characterized tops at the even hundred numbers are a result of a registration technical approximation. Any grouping which could have functional explanations are not visible.

Other factors ought also to be of interest for a functional evaluation of the dwelling sites - for example the extension from the beach inwards on the bank. Observations of cracked stone and flakes are nowadays often made in the turf above the beach scarp, but the possibility of such registrations are, however, greatly varying. A reworking of these observations only on surveyed material is, therefore, hardly meaningful. The extension inwards often increases greatly during excavation, while in other cases dwelling sites may be completely eroded through the centuries' denudation of the shore banks. As an example, a dwelling site in Rätan that ended inwards c 30 m inside of the present-day shore scarp may be mentioned (Sundlin: Rätan 145). There are also examples of dwelling sites which probably originally may have been located on the open beaches. The large dwelling sites of Åsarna nr. 2 and 3 are 360 respectively 400 m long and are located along the same straight beach of Lake Äldern, but one lies predominantly in the turf of fine sand above the shore scarp - visable up to c 25 m wide from that - and the other only on the open beach exposed only at low water level and situated outside boggy ground. Such beach zones may have been moved since the warmer period but a sojourn on the open beach under the low water level is quite imaginable - not least under a more favourable climate than the present. Even the changes of the seasons in the residence may be of importance as an explanation to such variations.

A clear difference in dwelling sites within different areas, apparent even at surveying, is also offered by the petrographical material. This has not yet been completely dealt with by geological experts but it is still clear that the Ljungan Valley offers a striking example of that. In the Rätan area quartz totally dominates the survey finds, which is also confirmed upon excavation (Sundlin:Rätan 145). One may, however, not completely ignore the fact that quartz is visually more available than darker rock types at surface collecting of somewhat dammed locations. In the area between Storsjön and

Klövsjön - above all near Gruckensjöarna - on the contrary, the find material is totally dominated by dark gray quartzites. This is also very clearly expressed through the only investigation in the area (Sundlin: Åsarna 28). Such quartzites are found in several cases - both within and outside of registered dwelling sites - in bare rock at rocky points in the same area. One of these locations has, moreover, a low but wide wall of cracked stone located on a plateau above the mere rock point (Åsarna 27). The quartz of the Rätan area might be found occuring in the area's granites (Lundqvist 1969: 15), and pink quartz has in modern times been quarried in the neighbouring parish of Överhogdal. In Haverö *hälleflinta* (that is to say silicified ash tuffs, Lannerbro 1976: 30) has, in certain cases, shown to be common (Baudou 1977: 109 and 1978: 17 through K Hjortzberg). Within other areas the percentage distribution between quartz and quartzites or brecchia quartz on dwelling sites has shown to be chronologically significant, which is evidenced on locations at fixed levels in N Ångermanland's prehistoric coastal land and stratigraphically in Ådalen and S Lappland (Baudou 1977: 57 ff, 82 ff respectively 30 f). The Ljungan example may suggest that the material variation may not simply be chronologically but also spatially involved. One cannot ignore the evident possibility that local adaptation and variability may have influenced the hunting culture also concerning choice of material for the manufacture of tools (compare Lannerbro 1976: 39 ff). This cultural category seems to be a suitable point of origin for a principle study of cultural diffusion versus adaptation within the hunting culture in Norrland.

Osteological analyses of the few investigated dwelling sites in the Rätan-Klövsjö area are unavailable at present. There is, however, no reason to suspect that the Ljungan Valley, in that respect, differs from Middle Norrland's dwelling sites in general, which are dominated by elk with beaver as the next largest component (Baudou 1977: 126 ff). That is also supported by excavations in Haverö (Selinge 1968: 14, Baudou 1977: 109 f and 1978: 18 through J Ekman). In the dwelling site's location and environment there is not either anything that suggests that other industries than trapping, hunting and fishing should have been of appreciable importance.

In Haverö, however, paleobotanical investigations have exposed a marked human influence in the pine forest during the late Bronze Age - probably in order to obtain grazing and fodder (Engelmark 1978: 45), which is why cattle ought to have appeared here during that time. No sure evidence of cultivation appears, however. In the river valley's lower part, in Tuna parish - that

is to say in the then coastal landscape - there is similar evidence already during the Neolithic. An influence on the landscape with weeds is considered to point to cattle breeding, and single grain pollen appears (Engelmark 1978: 45). A marked, but short, similar influence is also found here during the latest Bronze Age (Engelmark 1978: 46). These contributions in the Ljungan Valley's hunting environment must be considered as a parallel to several cultivation and/or clearing elements during the Neolithic and Bronze Age in Norrland, established during later years (Köningsson 1970: 27 ff, Huttunen & Tolonen 1972: 19 ff, Engelmark 1976: 97 f). These are, judging from the diagrams, sporadical and modestly extensive but are considered fully established (Baudou 1977: 60 f). Their originators have been characterized as "cultivating hunters" (Baudou 1974: 37). Compare 4.1.4 below concerning the interpretation of these elements.

The source material from investigations of extinct hunting cultures gives, as a rule, a good idea about the importance of trapping and hunting - that is to say about the animal part of the subsistence - while collecting of the vegetable food leaves few traces. During investigations of living cultures, however, that part of the subsistence appears to have had at least as great an importance and often been the most stable foundation (see several articles in Lee & DeVore 1968, Newell 1973: 415). With the point of origin from the strongly vegetarian dominated subsistence of the present-day !Kung Bushmen in the Kalahari area, Lee has given a summary over the components of hunting, fishing and collecting within 58 modern-day hunting cultures (1968: 41 ff). Their share varies greatly with the latitude. Collecting is completely dominant up to 40^{o} latitude, fishing has greatest importance between 40^{o} and 60^{o} and hunting first N of 60^{o}. If the hunting culture in the Ljungan Valley has followed that global pattern, is not surely established, but probable. More southerly elements ought, therefore, to have had relatively greater importance during the post-glacial warmer period than for an imagined present-day hunting culture at the same latitude. Fishing can, therefore, have had at least equally great importance as hunting, and one may count on stable and considerable contributions through collecting of vegetables. Especially the continual appearance of hazel in the inland may have had importance (Engelmark 1978: 42 f), but even mountain ash, bird-cherry and eventually other *Prunus*-types may have been used (Engelmark 1978: 44). Berries must be presupposed to have been used continually. Lingonberries, bilberries and cloudberries - the last named during the warmer period possibly more limited to the present-day mountain tracts - have probably as now had greatest importance, not least in order to secure a vitamin supplement. In addition,

root, fruit and plant parts of other types may have appeared (Gräslund 1974 B: 9).

Summarily, the location, formation and find material of the dwelling sites imply an economy which, with the water courses as a basic environment, comprehensively exploited the environment's natural production in both fauna and flora. The dwelling sites' locations suggest that this took place under continuous and probably regular mobility. In places and times there is - above all in the coastal land - evidence of a marginal influence on the environment in the direction towards a producing economic system. As far as is known today these elements have, however, not been able to change the basic structure in the mobile hunting economy.

4.1.3 Stray finds

As mentioned, there are no known dwelling sites in the area below the highest coastline with the exception of some immediately below the coastline in Borgsjö parish. That area in the lower valley is, however, important for understanding the relationships with the coast from the inner valley, rich in dwelling sites. Excavated or surface collected finds from dwelling site complexes have only seldom traces of larger tool types or of objects which are not considered genuine within the hunting culture. In that respect, the stray finds have another composition, since these, as a rule, consist of more spectacular objects which are easily noticed both during cultivation - in any case before the tractor's time - and during the general public's movement over the beaches. If one spatially examines the find sites for these, it appears that the cultivation finds, as a rule, are made in fields by the shores, which is why they probably, in many cases, ought to be found on or near dwelling sites (Selinge 1970: 23, compare Tennander 1972: 13). The frequency of the stray finds is, as such, no measure of the prehistoric activity in the area, since it to a great degree is dependent upon modern, non-archaeological factors (Baudou 1977: 25). For internal, cultural comparisons of types etc, however, the amount is usable, since the collecting of the finds from these viewpoints may be considered random.

Objects of S Scandinavian types can either be imported from the S or manufactured within the area under S Scandinavian influence (Baudou 1977: 53). These types are fundamentally important as imaginable, speculative background to the more marked, later southerly traits in the valley. Even many larger objects of Norrlandi or Norrlandic/easterly production are taken charge of

as stray finds. Stray finds can, in the lower valley, have importance for the interpretation of the relationships between the coast and the inland. Baudou (1977: 129) now interprets the sources so that the coastal land and the inland make up a common cultural area "to about 3 000 or 2 000 B.C." and that the small differences which, in spite of that, are noticed during this early period depend upon seasonal movements. This early difference has, however, also been interpreted as a contrast between a Neolithic and a Sub-Neolithic group (Baudou 1972: 19). Later - and above all during the Bronze Age - these differences are considered definitely depending upon the fact that different population groups exploited the coast and the inland.

In order to, if possible, throw light on the prerequisites for a similar dualism within the Ljungan Valley the find locations for N respectively S Scandinavian influenced stray finds within the province of Medelpad shall here be scrutinized. If these should originate from two different cultural or folk groups, probably some difference in the distribution ought to be evidenced. A complete examination of all the known objects has not been intended. Mainly the objects in SHM's catalogues over its own and other collections shall be dealt with, to which rather accidental notations in the Register of Ancient Monuments are added. There surely are, moreover, many objects in unreported smaller collections and in private ownership. Any spatial difference in the distribution of these and the sample dealt with here are, however, not probable as they have appeared in the same, fairly random way. From that viewpoint one may then presuppose that SHM's catalogues include a usable sample (compare Tennander 1972: 10 and 45). The examination of SHM's material was originally made by A Linder-Rissén in 1967 and has been completed by myself. The number of stray finds in Medelpad might not be measured with those in Ångermanland (Tennander 1972: 10, Baudou 1977: 53), but is judged quite sufficient in order to throw light on possible tendencies. The test includes 125 objects with known find locations.

Of the objects 65 have been classified as N Scandinavian and 60 as S Scandinavian. Possible easterly types have not been separated but counted among those in the first group since they are few and culturally probably more related. As S Scandinavian the following types or type groups have been counted: pecked axes, shaft hole axes (both Middle and Late Neolithic types), thin- and thick-butted flint axes, struck and partially polished axes of stone, of which several like pecked axes and others are more similar to thick-butted or thin-bladed ones, flint knives and flint points (compare Tennander 1972: 15). Of the N Scandinavian objects are stone clubs along

with different types of slate and quartzite objects most usual. Among these there are both knives of different types, points and axes, the latter often with a hollowed edge (compare Tennander 1972: 16 ff). The easterly types ought to be more unusual but a bent chisel is found in a deposit in Haverö (Selinge 1970: 19, Baudou 1977: 105). Within the area worked flint - that is to say foremost scrapers and flakes from dwelling sites - have not been counted, even though the material is imported. In addition, there are several objects without known find sites.

Distribution within the province, divided on the Economic Map sheets, is seen in Fig. 11. Any level distribution corresponding to Tennander's (1972: 39 f) is not possible to design without comprehensive inspections. As is seen the distribution is very even and any difference in a southerly or northerly dominated area may not be constituted. It is important that the northern type of objects are present in approximately the same frequency even in the coastal parishes and that the southern are there even in the western part, even if proportionally to a somewhat lesser degree. The distribution picture ought to be interpreted as that the southern objects occur in the same cultural environment as the northern ones. This result is in accordance with Tennander's for N Ångermanland (1972: 41 ff). The most probable explanation to this is that they were imported to the Norrland hunting culture and had obtained a foothold in it. The objects are relatively different in time - from the time of the pecked axes to Late Neolithic - but any distributive difference in periods is not evident here (compare Tennander 1972: 45 ff). However, a Middle Neolithic deposit of five thick-butted flint axes in Hässjö parish may be mentioned, which should be able to represent a dwelling site with cultivation (Christiansson 1974: 28, Baudou 1977: 51), likewise a concentration of pecked and similar axes near Hornsjön in Njurunda (Baudou 1977: 40, compare Selinge 1975: 27 f). In greatest probability, therefore, also the larger part of the stray finds originates from still non-recorded dwelling sites of the hunting culture's type.

Any wholly comparable review for the valley within the county of Jämtland has not been performed since that part has a clearly established hunting culture owing to the dwelling sites. Checkings in the catalogue of JLM has, however, indicated that the finds outside the registered dwelling sites are very few. It may, moreover, be named that according to the Register of Ancient Monuments the southern types are present even up in the source areas, among others several shaft hole axes from Rätan, Storsjö and Nyhem parishes, a couple of fragmentary battle axes from Rätan and a flint knife from Bodsjö parish

(SHM 1096, 1097, 1098, 5147, Raä Storsjö 15 and 16, Klövsjö 153, Nyhem 49 and Bodsjö 32). Struck flint is also present in the high mountain dwelling sites near Storådörren. From a chronological point of view the most remarkable stray find might, however, be a coarse-toothed bone or antler harpoon-head, which was found in Klövsjön during seine dragging (JLM 20658). It seems to be of Early Mesolithic character and has parallels, among others, on the S Scandinavian dwelling sites and in pollen analytically dated stray finds from the Boreal period (Björkqvist 1961, Clark 1975: 130 ff and 237, app. B). In above all the Klövsjö area there also is a number of stray finds of northern type - foremost stone clubs along with single slate objects. Several are found near or on the beaches and may originate from dwelling sites.

Contact with the coastal land during the Bronze Age is also established through at least three bronzes from the inland: a spear point from an islet in Ljungan in Borgsjö (Borgsjö *hembygdsgård*), a celt of the Mälar Valley type from Haverö in private ownership (Selinge 1970: 22 f) and a bronze blade from Gimån's outflow from Revsundssjön (Björkqvist 1932: 109 f). At the first named place there are also southern stone objects and probably a dwelling site (Selinge 1975: 30 f). In addition, there are several stray finds from the Bronze Age in the coastal land (Hallström 1924: 275). If these stray finds are stretched in their importance, they can then be interpreted as evidence for contacts between the coast and the inland from the Mesolithic throughout the Bronze Age. Any chorological cultural dualism is, accordingly, not possible to constitute in the present research situation by way of stray finds. I interpret, therefore, all these finds as originating from one cultural complex within the Norrlandic hunting culture.

4.1.4 Graves at lake shores

The grave constructions located near lake shores within the river valley has summarily been presented earlier (Selinge 1976: 39 ff, JBV: 400 ff). They cannot give any decisable contribution to the hunting culture's subsistence model but a principle discussion of these graves must from purely chorological and ancient monument reasons take place in this context. The graves' distribution is seen in Fig. 12, where each locality is marked in terms of numbers of graves and location.

Within the Ljungan Valley there are all total 103 registered graves through surveying in this environment, divided among 39 locations. The cemetery of

Krankmårtenhögen near Storsjön (Ambrosiani unprinted) stands in a class by itself with 29 graves verified through excavation, 25 of which were reconstructed and registered at surveying. A cemetery at Idsjön in Gimån has 7 visible graves. Otherwise, there is no site which reliably may be designated as a cemetery, but the graves are situated separately or in small groups. A cemetery near Holmsjön in Haverö is registered with 6 constructions, of which 2 are uncertain, but has been shown to consist only of natural formations except, probably, at least 2 completely disturbed graves with a surrounding trench (Selinge 1970: 25, Baudou 1977: 106).

The graves are made up - as earlier was pointed out (Selinge 1976: 40 ff, JBV: 400) - as a rule, of stone settings with an uneven, bare stone filling of round or nearly round form. Surrounding stone chains may occur in these. On Krankmårtenhögen, however, triangular stone settings with middle stones, well-laid surrounding stone chains and upright corner stones completely dominate the number of graves. Some of these also have gravel filling in the outer parts and two had shallow surrounding trenches. In addition, there is an upright stone, completely unique for that cemetery. Exceptionally here - only registered in a couple of cases in Haverö (Selinge 1970: 25) - there are also barrows or turf-covered stone settings with surrounding trenches. Only these are of the same shape as the graves in the Iron Age settled areas. That the grave custom generally should have been introduced from there (Baudou 1974: 40 and 1977: 105) can, therefore, not be correct. On several occasions I have also - completely against Baudou's reference of my standpoint (1978: 5) - proposed that the different traditions of grave constructions speak against a similar derivation (Selinge 1970: 26, 1973: 231, 1976: 69 f, JBV: 400). An attempt to interpretation must, therefore, start from the graves' own environment.

As I several times have emphasized the localizational element in the environment for these graves is the shore. This means that behind this localization a positive evaluation of the shore as an area of interest must lie. This interest can, because of the graves' ideal character, lie within a religious cultural category - for example by attaching conceptions about the beyond to the shore or the water. It may also be that the shore was important from other aspects - for example, concerning residence or rights. One may, for example, have wished to claim a shore section as a territory for the social group to which the deceased belonged. The group's interest has then, probably, in reality been based on nutritional-ecological relations - that is to say, the group's residence in the area has been tied to the shore and the

lake as a nutritional-economic base. That means that one can apply similar environmental aspects on these graves as on the graves in the coastal environment, which by level relationships are clearly bound to the contemporary shore. The solutions may in that case be sought after principally the same guidelines in the two environments (compare 4.2.2 below). The greatest problem with the interpretation of these graves is not however, as in the coastal environment, the lack of dwelling sites, but the question of the lacking contemporaneousness between the graves and the dwelling sites existing in the same area. One can then say that the absence of reliably contemporary dwelling sites is common to the two grave environments. The spatial relationships between graves, dwelling sites and the general hunting environment is near the lakes, however, clear and incontestable.

In Fig.13 the distribution of these grave locations is illustrated, likewise the general extension of the known dwelling site occurences and the localization of the Iron Age settled areas, in relation to the rivers' drop profile. In the figure the location of the highest coastline has also been marked, which generally is also the upper limit for the easily cultivated bay and river sediments, which constitute the most important economical basis of the Iron Age settled areas (compare JBV: 180 ff) and to which also the Medieval colonization is mainly tied (compare Fig. 27 below). The relationship between the environment of the lake graves and the dwelling sites along with the opposite of both to that of the Iron Age settled areas is illustrative. This general spatial relationship is comparable also in more detail. Within the area with completely surveyed dwelling sites there are 8 grave locations. Of these only two, near Handsjön in Rätan, lack registered dwelling site remains at the same location, but also these have dwelling sites within the nearby area. In Haverö parish have previously unknown - that is to say by ocular inspection non-visible - dwelling sites appeared at both grave excavations in the area (Selinge 1968: 14 f, Baudou 1977: 106 ff and 1978: 13 ff through K Hjortzberg). Further, one grave in Haverö and one in Revsund (Selinge 1976: 46) lie near accidentally registered dwelling sites and that can, therefore, with great probability, apply to several graves within areas, not surveyed for dwelling sites. Even if the spatial relationship does not necessarily need to be comparable with a cultural and still less by a chronological one, can the coincidence to at least 75 % within the area surveyed for dwelling sites hardly be random. In any case the use of the same environment is fully shown.

The question is then if this environment is the same within the graves' as well as the dwelling sites' time of construction and how widely differing these are in time. From the totally excavated Krankmårtenhögen there are few c 14 datings, which reliably can be related to the underlying dwelling site. A couple of these are very old, while the youngest is practically contemporary with the oldest dating of resin tightening in the graves (340 respectively 380 B.C $\pm$ 70, uncalibrated values, Ambrosiani unprinted). The samples do not prove any contemporaneousness between the dwelling site and the cemetery but make, however, one quite possible and to a certain degree probable. In addition, there are two samples from hearths of fire-cracked stone, of which one lies in the cemetery and originates from its time of construction and the other lies stratigraphically over a grave and has given the value of A.D. $\pm$ 100 (uncalibrated values, Ambrosiani unprinted), that is to say, after the cemetery's time of construction. The two last mentioned are, however, not necessarily tied to a stone technology but the hearth and the fire-cracked stone are of the same type as from the Stone Age dwelling site. Paleobotanical investigations are unfortunately lacking here. That the cemetery belongs to a hunting culture is, however, to a high degree probable through the rich sacred deposits of elk antlers on top of the graves (Iregren unprinted), one of which is dated contemporary to the corresponding central grave (Ambrosiani unprinted).

The above mentioned paleobotanical investigations in Haverö have certified a human influence on the environment also during the Iron Age. One of the graves near Holmsjön has already during the 1860's given finds from the Late Iron Age (Selinge 1970: 26) and the only completely typical barrow has recently, through dating comb fragments, appeared to have been constructed during the Viking Age (Baudou 1978: 14 f). An earlier dating to the Migration Period (Baudou 1977: 109) was obivously built upon a spear point that was difficult to determine and has been abandoned. The relationsthip with the paleobotanical results is, nevertheless, of great interest. These have, for the Iron Age, been described in this way: "From about 0 A.D. weed pollen grains appear regularly once more and the grass and juniper pollen curves become continuous. Their pollen frequencies remain low up to the close of the Iron Age, but are sufficient to indicate that pastures were continually in existence in the vicinity of the sampling sites. ... The establishment of the Iron Age settlement cannot be precisely dated at the other sites, but Juånäs and Haverövallen would seem to have been colonized just before and Byberget just after 0 A.D. In the Juånäs and Haverövallen profiles cereal pollen is present but not at Byberget"(Engelmark 1978: 46). The Viking Age

barrow lies near the location of Byberget (a more correct name would be Byn after the village). Baudou has interpreted these relationships so, that "... first in the middle of the first thousand years A.D. one finds traces of a permanent agriculture and animal husbandry. The Iron Age mound at Bysjön must be set into relation with the later phase of cultivation" (1977: 110, compare 1978: 20 p. 5). According to my understanding Baudou has drawn chronologically too narrowly precisioned and essentially too far-reaching conclusions from the cited paleobotanical results. Judging from the pollen diagrams (Engelmark 1978, foremost 54 f) it seems to exist, for the location near Byberget, more of a degree than of a type difference between this clearing phase and the above named during the later Bronze Age, and cereals are first found at a period which is later than 400 B.P. These early evidences of human environmental influence are, however, of great principle interest and similar investigations ought to be carried out in several other areas - among others, in the vicinity of the considerably older Krankmårtenhögen. The environmental changes near Holmsjön seem, moreover, to begin during Krankmårtenhögen's time of construction. Haverö is, to date, the only area in the inland with investigations of that type. One ought to count on the possibility of fundamentally similar results in all similar environments - for example in the Rätan-Klövsjö area.

Baudou maintains that a combination of several types of subsistence is probable as an explanation of the appearance of the lake graves, but that agriculture and animal husbandry were the most essential (1978: 22). One also considers a continuous development from the principally sub-neolithic pattern (compare 6.3.1 below) of the Iron Age to the Medieval sedentary agriculture as probable (Engelmark 1978: 46 f), and that this is a manifestation of the fact that the inland, as early as during the Iron Age, is a part of the agrarian system of the coastal land. This hypothesis should be worth testing within a river valley, where the settlement of historical times is later than in Haverö. The upper Hårkan tributary in the Indalsälven's river basin is an adjacent example, where numerous Stone Age dwelling sites and occasional lake graves are known (Löthman 1978: 26 f), but the settlement of historical times, disregarding a slight beginning during the late Middle Ages, principally has been founded through colonization during the 18th century (Rudberg 1957: 130, 134 and map 5-6). If Baudou's hypothesis is sound, a clear gap would exist here between the supposed neolithical agrarian elements and those of Modern times. If such a gap could not be verified here, one might be compelled to take up a renewed discussion on the nature of the paleobotanical sources of the sub-neolithical elements as a

whole. Within the Ljungan Valley they are considered to be clear indications of a sub-neolithic cultural pattern, according to the here cited and accepted interpretations. Concerning another area with similar evidences of occasional neolithical elements (Huttunen & Tolonen 1972: 29 f) the possibility of an explanation through pollen dispersion from greater distances has informally been questioned (R. Engelmark personal communication 1977-05-19). Before a test of the proposed kind is available, therefore, in my opinion a certain, principle cautiousness is justified according to the validity of these occasional neolithic elements as a whole.

As a probable main result remains, nevertheless, until further, that certain changes through human influences might have taken place in a previously genuine hunting environment in different parts of the valley during different periods of time - during the Neolithic, Bronze Age and Iron Age. The graves near the lake shores appear, as is now known, mainly within the last of these phases but it is still not stated if this is represented in the whole valley.

4.1.5 Trapping pits

Still one group of completely functional archaeological sources for knowledge about hunting nutrient activities is stated within the valley. This is, however, not as those dealt with up to now conditioned by residence or settlement and not either as these localized mainly with respect to the water courses. It has, with greatest probability, also a much wider chronological frame than the material previously dealt with. This source group is made up of trapping pits.

Trapping pits are remains of a highly specialized hunting activity for extracting products from the natural ecosysten. I have, on another occasion, characterized pit trapping as a passive hunting method since it does not require the presence of the hunter (Selinge 1974 B: 20). The game is not sought out, but the hunting construction breaks off its natural passages. From the viewpoint of energy extraction similar constructions have been characterized as "facilities" compared with the more active "implements" (Binford 1972: 65). Pit trapping requires, therefore, good knowledge of the fauna in the area and its habits and ecology. It may have the character both of a main way of food supply in a pure hunting culture and of a subsidiary way in an agrarian dominated culture. From a chorological viewpoint they witness more the localization of the ecological resources than that of cultural categories.

Within the Ljungan Valley just more than 2 200 trapping pits are registered, spread over 216 Economic Map sheets which lie within or touch the valley (Fig. 14). Single ones of these trapping pits on bordering maps may lie on the other side of the water-sheds. The average number is just more than 10 pits per 25 km^2 within the sheets with locations. Counting the whole surface, they lie essentially much more spread out, since about 370 squares in the mapping net within the valley completely lack trapping pits. Of the archaeological sources, which are evidenced in this context, however the trapping pits are, without comparison, the most widespread cultural phenomenon. They appear, then, within practically the whole valley but have highly changable frequency. The frequency variations can probably have both game biotopical, culture-chorological and chronological reasons.

The trapping pits' extensive distribution within the valley is, however, representative evidence for that, practically speaking, the whole area has been exploited for hunting activities. Since the most important prerequisite for the distribution of the pits is the appearance of big game, the distribution picture is evidence that the whole valley has been attractive for big game hunting. This general distribution must, therefore, also concern other hunting mehtods as archery, snaring, hunting with gaps in fences and self-triggered missiles, etc. These methods have, however, in comparison to pit trapping not left any visible remains. If that had been the case, the now partially uneven and sparse distribution picture should have been considerably more even and denser, since it may be taken for granted that other hunting methods have been used to a higher degree in the terrain sectors, where pit trapping for different reasons have been unsuitable or demanded too great an exertion - for example because of ground conditions or relative poverty in game (compare Selinge 1974 B: 24). Disregarding the pits' dating the valley's character of a total resource area for big game must have been an equally important advantage during all periods - in any case until that period during more Modern times when the elk, judging from historical sources, began to grow more scarce (Selinge 1974 B: 5 with op.cit.). Both of the pits' construction, of traditions about their use and of their distribution is completely explained that they were predominantly used for elk trapping. This ought to be compared with the above mentioned dominance for elk bones on osteologically investigated Stone Age dwelling sites.

The pits' constructions, their combinations in groups and systems along with the from these dependent, somewhat differing hunting methods has, in short, been dealt with in another context (Selinge 1974 B: 12 ff), and a more

comprehensive investigation on Norrlandic trapping pits in English is under preparation. Some considerable chorological or chronological differences in the mentioned functional respects have, to date, not been able to verify. Datings through excavation or sampling are not yet available from the Ljungan Valley. Within other areas with similar cultural topography datings have, in any case been obtained from the Neolithic/Bronze Age and up to the first part of Modern times (Selinge 1974 B: 32 f and unpublished investigations). It is probable that a similar chronological distribution may appear also in the Ljungan Valley without being able to verify that from the pits' appearance, combinations or location in the terrain.

From a chorological viewpoint one may observe that the trapping pits appear within the same area as other sources dealt with here. A concentration to the area around lakes rich in dwelling sites may appear - for example Rätansjön (compare Selinge 1976: 45) and Storsjön - while this richness is not obvious near other similar lakes - for example Klövsjön (Fig. 20) and Holmsjön in Haverö. In relation to the permanent Iron Age farming settlement a marked hunting pit richness is noticed only around the valley near Medelpad's uppermost settled area in Torp (compare Fig. 14 and Fig. 18), while the lower, larger settled areas are surrounded by forest areas relatively poor in trapping pits, which probably applies even if one takes into consideration the faults in the present-day registration. Very noticeable is the large richness in trapping pits in the form of a long systematic line of almost 80 pits in the same mountain valley as the two uppermost barrows in the Skärkan Valley. Even in a valley in the Oviken Mountains in the N part of the distribution map are the pits numerous. The relatively even distribution in the lower forest lands and around Gimån's course through Jämtland is also clearly attached to the farming settlement from the Middle Ages and more Modern times (compare the map Fig. 27 below). It is probable that a large number of trapping pits within these areas may derive from historical times, but that trapping pits have also been used during the epoch of the prehistoric hunting culture cannot be excluded.

In this context the trapping pits may be seen as evidence of the continual importance of big game hunting - as a main way of food supply within the hunting culture and as an important subsidiary way within the farming culture. The process, at the transition of pit trapping from the main way of livelihood to a subsidiary one, is then too - under the prerequisite of a continual use of trapping pits - of importance for the understanding of the cultural development in the valley as a whole, even if the present lack of chronological

bases makes the utilization of the trapping pits in that context more difficult. The construction and use of the larger trapping pit systems also prerequires a social organization which probably was developed within the society of both the hunting culture and farming culture. To date, a formulated general hypothesis about the origin of pit trapping within the previous society and inclusion in the latter in the form of a cultural diffusion, applies also to the Ljungan Valley (Selinge 1974 B: 36), but its applicability ought to be proven through comparison with other cultural categories under the investigation of the relationship between the cultural systems.

4.2 COASTAL SYSTEM

Concerning this ancient monument complex the whole province of Medelpad will be taken into consideration since only the coast outside of Ljungan's river basin makes up a too limited basis for conclusions. The cairn complexes of the Medelpad coast are not either delimited from the distribution of the similar along the whole of the Norrland coast. The presentation here builds to a great part upon the reworking which preceeded the earlier summary (Selinge 1973: 220 ff). As is seen in the method model this ancient monument system is the most poor of the archaeological source material.

4.2.1 Environmental factors

The ancient monument system makes up a part of the sparse, but in large continuous stretch with ancient monuments of cairn character, which stretches along almost the whole of the Norrlandic coast (Baudou 1968: 13 f, Selinge 1974: 33 f). In Medelpad these ancient monuments are located partially on the Norrlandic coastal plain in Njurunda and Tynderö parishes and partially on the Norrland terrain's steep coast near the inner part of the Sundsvall Bay, which is here built up of the fault line along Ljustorpsån-Alnösundet-Armsjön (Hjulström 1955: 22). Because of the slight hilly topography of the coastal plain, rich in details, an archipelago was created at the emergence from the sea, which was still more obvious at the higher coastlines (JBV: 397). In spite of the seemingly similar prerequisites, ancient monuments are lacking almost completely around the mouth bay of Indalsälven while they appear at Ljungan's. Most of them are, however, situated in the coastal plain's outer archipelago landscape without connections to the rivers. It is important that they are completely lacking along the contemporary, deeply penetrating *fjordar* (narrow, deep bays), which at the time of their construction filled up the present-day river valleys far into the Norrland terrain's high plateau (Selinge 1973: 221). The conclusion must thus be that the vicinity of the open sea has been of decided importance for the grave constructors. The concentration of graves is, in Medelpad, most dense near shallow and flat

coasts but even deeper and steeper ones have been used.

Along Norrland's coast - usually slightly inside of the present-day coast - runs a band with relatively high percent exposed bedrock (Lundqvist 1943: 16 and Plate 2). This has been laid free through abrasion during the elevation of the land and may be areally extensive. Along the river valleys there is, on the other hand, bedrock as was named above (2.1) only at certain places in the plateau land's higher lying edges, where it lacks contact with the ancient monuments' locations in the valleys. The abrasion has also had the consequence that the moraine under the highest coastline has become more or less washed out (Rudberg 1962: 38 ff), which on the coastal plain has given a great amount of lean sand, surged gravel, coarse boulder moraine and cobblestone (Lundqvist 1943: 156, Hjulström 1955: 44). The coastal environment's graves lie just on these unfertile soils with 49 % of the sites located on rock, 34 % on moraine and 16 % on combinations of these ground types. In numerous areas there is not either - on account of the large distance to the glacial river mouths - easily cultivated sediments on corresponding levels in the vicinity of these locations. As a result of these relationships the area of the coast-connected graves have not either attracted permanent farming settlement during historical times. In Njurunda parish, for example, the coastal land has consisted of commons and been used as outfield areas for fishing and pasture for the farming villages, located considerably farther into the parish (Löfgren 1922: 166 f with others). Considerably more than 80 % of the grave locations lie, therefore, also still in woodlands. In the neighbourhood of Sundsvall these areas have been built up first in connection with urban and industrial exploitation during the last century. The ancient monument environment constitutes, therefore, both in a geological and a cultural landscape aspect a strong contrast to the Iron Age settled areas (compare JBV: 180 ff and 209 ff). Expressed in geographical terms, the archaeological coastal environment is situated within the coast and archipelago zone (Lundqvist 1943: 151 f), in settlement terminological aspects, in the zone of the fishing villages (Hjulström 1955: 132).

The coastal land's climatical condition is today characterized by, among others, somewhat lower precipitation, somewhat higher numbers of sun hours, higher average temperature in the winter and a somewhat longer vegetation period than the inland (Rudberg 1962: 50 ff, Atlas över Sverige 25-34). The zone with a climate, characterized as local maritime, seems to exactly coincide with the archaeological coastal environment (Ångström 1942: 60 ff). Paleo-climatological investigations concerning the prehistoric conditions are not available but during the time of construction for most of the graves the

climate was warmer and possibly more continental than now (Hellman 1946 with op.cit., G Lundqvist in Atlas över Sverige 21-22, Engelmark 1978 B: 4). A warmer and drier climate after a transgression under Neolithic times may believably have been associated with higher amounts of salt in the sea, which may have had influence for the nourishment possibilites (Lundqvist 1943: 133 f and 1963: 77 f, Engelmark 1978 B: 4). Paleobotanical investigations are not available at present.

4.2.2 The graves and their location

The distribution of the graves within the Economic Map sheets - that is to say, per 25 km^2 - is seen in Fig. 15. The frequency seems in large to be the same and with similar local variations as along the other parts of Middle Norrland's coast (compare Selinge 1978: Map 5). The number of registered graves within the coastal environment in Medelpad is seen in the following brief table.

Parish	Type						Totally preserved graves	Removed graves	Total number graves
			Stone setting						
	Cairn	Long cairn	Round	Oval	Rectangular	Ship-formed			
Njurunda	64	7	42	7	1	1	122	2 (+45)	124 (+45)
Tynderö	27	2	32		3	2	66	6	72
Others	27	1	16		2	1	47	19	66
Total	118	10	90	7	6	4	235	27 (+45)	262 (+45)

Approximately 50 % of the preserved graves consist, therefore, of round cairns and hardly 40 % of round stone settings, while the other types of ancient monuments have unimportant portions. The share of cairns appear here to be somewhat less than within other parts of the Norrlandic coast (Selinge 1978: 6.2 with op.cit.). The stone settings are, quite as the cairns, always built of bare stone filling. From these only one cemetery, to a great degree destroyed, at Dårholmen in Njurunda is different. It has been untypical for the coastal environment both through the type of ancient monuments and the grave number (JBV: 393 f, compare the number 45 in the column for removed graves). The more unusual types consist likewise of stone material and appear, in general, within the higher shore levels (Selinge 1973:222). Visible constructions are present on both higher and lower levels but preferably on the first named. Some 20 graves have a visible cist in the center part, while a dry-

stone walled edge and a surrounding stone chain appear at some 25 ones each - that is to say 10-11 %. Spatially these details are evenly distributed. Even with regard to size the ancient monuments are distributed very evenly. In this way, Njurunda and Tynderö have exactly the same values of the round cairns' minimum, mean and maximum size. The stone settings consistently are somewhat smaller. Concerning the distribution picture 57 % of the ancient monument locations are made up of single graves and 33 % of groups, which is why the number of registered cemeteries is considerably less than in the Iron Age settled areas (compare JBV: 207). The coastal environments' ancient monuments show, in all of these respects, great similarities with the coast-connected environments within other areas and make up a very clear contrast to the Iron Age settled areas.

The location of all the graves above the 20 m level, in relationship to an imaginary shore 30 m above SL - that is to say the shore line of the Middle Bronze Age - has earlier been published (Selinge 1973: 221, compare JBV: 397). The relationship to that shore level is generally seen very clear. For the graves' detailed localization the example of Fig. 16 is characteristic. It is taken from the higher located grave levels but the localization is similar also of the lower (JBV:397 f). The localization is wholely similar to that of other parts of Norrland's coastal lands (Thålin 1962: 70 f, Baudou 1968: Fig, 27-29, 41-42 and 46-50 along with page 148). The Njurunda example clearly shows the location on islets and continental points near shallow or shallowing straits and it also appears that the graves are grouped at definite levels. A smaller number - approximately 26 % - lie on crest parts but location in slopes and on terraces is more usual - a total of approximately 62 %. Any support for the usual theory of selective height locations does not exist in this material (compare Meinander 1954: 93 f and Stenberger 1964: 308). The locations cannot be interpreted in another way than as a function of the contemporary shore level (compare Baudou 1968: 89 f, Selinge 1973: 222 and JBV: 389).

The graves are our only source for the prehistoric settlement in the coastal environment. Their restraint to the shore must be interpreted as human residence in the area was directly dependent upon the shore. Such a dependence can alternatively be explained by at least two hypotheses. One of these originates in the graves' ideal character, and the connection to the shore ought, then, to be dependent of religious or other irrational factors (compare Hellman 1971: 23 and 4.1.4 above). According to the alternative hypothesis, the graves ought to be tied to the areas of settlement, that is to say, that the culture's ideal manifestations are dependent upon its functional localiza-

tion. If settlement or residence was tied to the shore, that will have a decided importance for the interpretation of the cairn builders' economy and livelihood. The hypotheses can hardly be tested on material within the area, since no reliable dwelling site finds connected with cairns are known. An attempt shall, instead, be made with an analogy to a grave environment with a similar burial custom and grave constructional tradition but with known dwelling sites.

4.2.3 The habitation problem

Dwelling sites which quite surely can be connected with the Norrland coastal cairns are, on the whole, not known. If the hypothesis about the grave localizations' ideal conditioning is applicable, that may be because the dwelling sites lie far from the cairns and not as these are tied to the shore. If the hypothesis on the dependability of the settlement to the shore is applicable, the absence of dwelling sites may be due to the fact that the cairns are located in rugged, uncultivated terrain, where the prerequisites of finding dwelling sites are minimal. During later years, a couple of dwelling sites from the Bronze Age have been excavated in the coastal lands of Hälsingland, Ångermanland and Västerbotten (Baudou 1974 B: 45 respectively 1977: 48 f, Christiansson 1974: 32 ff), the first ones with finds of ceramics along with artefacts and flakes of quartz and quartzite, the latter with, among others, arrow points with a straight base. The dwelling site in Ångermanland in Vibyggerå parish probably lies without direct relation to the contemporary shore in present-day cultivated soil and at more than 2 km distance from the nearest coastal cairn location. The dwelling site in Hälsingland lies at about 7 km away and the one in Västerbotten at about 10 km away from coastal cairns. In spite of probable contemporaneousness, these dwelling sites have not conclusively been approved to have been used by the cairn builders (compare Baudou 1974 B: 45 f). If this, however, should be the case, the first of the above stated hypotheses must be applicable and one cannot then, with consideration of the cairns' location, make any conclusions about the cairn builders' economy and livelihood.

Baudou (1968: 62 ff) has made a comparison between different parts of Scandinavia concerning traditions in grave building and burial customs during the Bronze Age. He draws the conclusion that burial customs - that is to say the grave's inner construction and find conditions - are very similar over large areas and have gone through a, in general, contemporary parallel development, while local variations appear in the tradition of the graves' external, architectural constructions. If one solely takes into consideration graves in a coastal environment, which is similar to that of the Norrland

coastal cairns', the tradition of the external grave construction becomes, however, even more homogeneous. An important conclusion is that burial customs and the traditions in grave construction within different parts of the country expose a relationship in religious ideas - in any case, concerning the ideas about death (Baudou 1968: 104). Such a communion of tradition of grave construction and burial customs ought, then, also to have a correspondence concerning grave localization - whether it is ideally conditioned or tied to the dwelling site locations. If a certain religious idea about the graves' localization near the seashore far from the dwelling sites was accepted in Norrland, it ought then, therefore, also to be traced within other cairn areas with the same burial traditions.

The hypotheses can be tested on cairn areas with known dwelling sites. The nearest of these is the Mälar Valley, where cairns and stone settings of bare stone filling appear in more sparse or dense concentrations within areas which, like those in Norrland, often lie separated from the settled areas of both the Iron Age and historical times. Within these cairn areas there are, however, numerous evidenced dwelling sites, which are indicated by heaps of fire-cracked stone in direct connection with the graves - probably to a much greater extent than what is yet known through the surveying of ancient monuments. Within the W parts of the area numerous locations with rock carvings and cup marks also appear in the same type of prehistoric environment (Kjellén & Hyenstrand 1977: 17 ff). As an arbitrary chosen example from the Mälar areas' E part, a sketch is presented here over a small area revised for the Survey of Ancient Monuments in 1977 and located in the inner part of Roslagen (Fig. 17, surveying inspected by myself). Concerning this and with great probability also a large number of areas of similar character, the following factors, relevant in this context, may be established.

1. The grave types (cairns and dominating round, earth-free stone settings) are completely corresponding to those dominating the coast of Norrland and appear in similar, though often denser distributional pictures.
2. The dwelling sites, indicated by numerous heaps of cracked stone, are lying in direct contact with the graves, which are not known concerning coastal Norrland.
3. The settlement area is not - as the graves in Norrland - situated near the open sea but drawn back far into a contemporary, winding bay or marsh system - in this case, ca 20 km inside of the contemporary coast and in other cases considerably farther in. The question of immediate connection to the shore or not cannot be decided for the Mälar Valley only with this example but both this distributional picture and earlier investigations

(Ambrosiani 1964: 60 ff and Hyenstrand 1966: 96 f) speak for that this connection, in any case, might not be of the same direct character as in Norrland (compare Kjellén & Hyenstrand 1977: 20 and 27 ff).
4. The ancient monuments' environments are both in the Mälar Valley - in any case in Roslagen - and in Norrland completely fossil and without every evident contact with later cultural environments.

Of these relationships I am inclined to draw the following conclusions. The burial customs and the traditions of outer architectural constructions of the graves - that is to say the main ideal factors - are similar in Norrland and the Mälar Valley, which is why the localization of the graves in relationship to the dwelling sites - that is to say a related ideal factor - ought also to be similar within the two areas. The cairn builders' dwelling sites near the coast of Norrland are, therefore, probably lying within the same areas of terrain as the graves. These areas may have the character of coastal bound territories for the cairn builders' social group. That the dwelling sites still have not been found can depend upon the ruggedness of the terrain and inconsiderable cultivation, perhaps also upon the prehistoric culture's mobility. The cairn environments in Uppland and near Norrland's coast have, on the other hand, differing ecological prerequisites and can, therefore, have different types of economical systems. In the Mälar Valley on the flat land basins around the far-reaching bays and inlets an agricultural culture with main emphasis on animal husbandry along with, in places, also rich metal handicraft (Schönbäck 1959, Hyenstrand 1966 and 1968, Jaanusson 1971) has been evidenced. The great number of heaps of cracked stone speaks for has been evidenced. The great number of heaps of cracked stone speaks for a considerable permanency of sojourns of long duration in residence. The coastal other hand, definitely that the sea is a base resource for the subsistence system in the coastal culture (compare Baudou 1968: 151 and 1977: 136). Animal husbandry may have occured but grain cultivation is hardly believable with consideration to the soils chosen. Its eventual occurence ought, however - especially with consideration to the above mentioned analysis results in the Ljungan Valley - to be investigated through pollen analyses in the coastal environment. It can be recalled that the, to date, evidenced very sparse cultivation in the hunting environment (Baudou 1977: 60) lies near lakes or deep-penetrating bay systems not unlike those in Uppland. The same is also valid for the neolithic cultivation in Västerbotten (Christiansson 1970: 39 f).

In the situation of today's research, therefore, the hypothesis about the grave localization's purely religious-ideal conditioning without considera-

tion to dwelling site location may be rejected and the hypothesis about the dependence of settlement to the shore in connection with the graves may be accepted. This also brings up a source critical consequence with consideration to the model, constructed for the archaeological sources (Fig. 3). Grave tradition and grave architecture may - if the interpretation is correct - be spread and appear independent of economical systems or, in any case, appear in similar forms within different cultural-ecological models - in this case in Uppland and the coast of Norrland. This is, from a researcher's viewpoint, a result of the difference between ideal and functional remains. Different cultural categories - for example religion and conceptions about death on the one hand and economical systems on the other hand - may, then, have different areas of distribution, which only partially cover each other. The total functional cultural systems may, therefore, normally be built up of morphologically or concerning frequencies differently made up combinations of cultural categories. The relationship may be interpreted as a result of cultural adaptation and variability (Binford 1972: 238, compare Baudou 1968: 104).

4.3 AGRARIAN SYSTEM

The farming system is treated in detail in JBV and summarized in section 1, which is why I merely recall here where the factors, important in this context, are treated and make a couple of minor completions.

4.3.1 References and complements

The environmental factors - especially regarding the habitat - I have dealt with in JBV 2.1 and the spatial distribution in 2.2. The problems surrounding the organization of the units for economy and food supply are treated in JBV 5.1, while the economical life and the partially known paleobotanical sources to that become the objects for investigation and comments in JBV.6. Summaries may be found in the corresponding parts in section 1.

The distribution of the agrarian culture of the Iron Age in the Ljungan Valley has here, for the sake of comparison in a simplified manner, been put together after the main map in JBV to Fig. 18. The scale of the grave frequency there is the same as within the corresponding map for the coastal culture, which clearly marks the difference in density between them. According to the hypotheses for subsistence models presented here these differences in frequency may mirror the environment's carrying capacity for maintenance within a hunting culture respectively an agrarian culture. That is significant under the prerequisite that the burial customs were practiced during, in other respects, similar social prerequisites - for example concerning

social selections for burials and grave construction (JBV: 347 f). With consideration to the coastal culture's probably some hundred years longer period is, however, the effect in reality still more marked than what the present differences in frequency give the impression of.

On the map of the agrarian settlement three of Medelpads large settled areas (Njurunda, Tuna-Attmar and Selånger) and three of the small (Stöde, Vigge and Torp) along with some scattered graves are comprised, that is to say, all total just more than 1 650 graves. Medelpad's remaining settled areas (compare JBV) are lying outside the river basin of Ljungan. For the sake of completeness have just more than 40 known graves in Jämtland also been included - mainly within Lockne parish - which are located within Ljungan's river basin. They are, however, from a cultural-historial aspect included in the settled area around Storsjön in Jämtland (Selinge 1976: 46 ff) and are, as a rule, not treated later on.

During the discussion of the then available paleobotanical investigations in JBV (360) the hypothesis was posed, that the pollen investigations in Medelpad should be able to show an intensive expansion phase already during the Early Iron Age - corresponding to that in Ångermanland during the Viking Age. This claim now seems to be verified through the results from Lake Rudetjärn in Tuna parish, where the development was described as such: "No cereal pollen grains were found until about 200 A.D. From that time onwards the pollen curves for grassland plants and cereals are continuous, indicating that at about that date a change in land use occurred. The new settlement was undoubtedly based on a sedentary farming economy" (Engelmark 1978: 46). The beginning of the expansion phase agrees, in consideration to possible sources of error, well with the archaeological sources in Vattjom (JBV: 310 ff), where the tarn is located. One may also question if not a decline in the cultivation curve during the later Middle Ages may be an indication of the supposed Medieval abandonment at Rude (JBV: 309 f). Unfortunately no complete diagram could be obtained from a bog in the immediate vicinity of the earlier treated Iron Age farm at Tuna (Engelmark 1978: 38 f, compare JBV: 332 ff).

4.3.2 Location of graves in the mountain valleys

Graves of the same type as in the Iron Age settled areas are, however, also found in a wholely different section of the valley, namely in its highest situated parts closest to the mountains. These graves constitute a part of an ancient monument environment, unique for the whole country in upper Härjedalen. In all, around 60 graves are known within that complex and the large

number of these are lying within the upper parts of Ljusnan's river valley to the S (Selinge 1976: 25 ff and 54 ff, Jönsson 1978: 27 ff). Within the Ljungan Valley 13 barrows are located, 10 of which lie within the present-day infield areas of Ljungdalen village (Fig. 18). This is the uppermost modern farming village within the river basin. One barrow lies at the tree-line of the low mountain Torkelstöten above and W of the village and two near a mountain pasture (Sw. *fäbod*) in the Skärkan Valley to the S of the village. The barrows in the village lie at c 625 meters above SL, the others 150-250 meters higher. All the graves are made up of barrows with a marked, surrounding trench, which in the barrow on Torkelstöten also is equipped with a cist-like "door"-construction in the S. Several are of inconsiderable size, the two biggest are, however, 10-11 m in diameter (Selinge 1976: Fig. 17).

The barrows within the village lie on the sand plain which was formed during the late glacial period up here by an ice-dammed lake (Lundqvist 1969: 320). It onsists of fine sand and silt and is now cultivated. It is, however, because of the altitude above the sea, hardly suitable for the cultivation of grains. The other three barrows, located still higher, lie in a terrain, which in historical times was used for grazing lands and the collection of fodder. In the Skärkan Valley runs, however, also a long system of trapping pits, in all a total of 71 pits, along the valley past the barrows. The graves' ecology give then no homogeneous directions on the prehistoric mound builders' maintenance in these highly located valleys. The same interchange between the valley bottom's and the treeline locations are more outstanding in the richer Ljusnan Valley - as well as the same vicinity partially to *fäbodar* and partially to the systems of trapping pits (Selinge 1976: 55 f). Both animal husbandry and hunting appear from these points of origin to be a possible subsistence for those who built the barrows. In Ljungdalen village there are traditions that several Medieval deserted farms - so-called *ödesbölen* - should be found. Some fossilized fields, which in the usual cases are the typical element of these (Selinge 1972: 176 f), have, however, not been able to relocate. The village was probably permanently settled first from the 1600's (Modin 1949: 238 f, Nordberg 1977: 18). The interpretation about three farms, continually occupied from the prehistoric period (Hvarfner 1962: 163), has, therefore, no support in the sources in spite of plentiful traditions (Modin 1949: 236). The village's modern maintenance may, therefore, not either directly be used as a parallel to the Iron Age's, even if the dominating similarity in environment speaks for the fact that comparisons may be found. A connection with the larger agrarian settled area in the lower Ljungan Valley is, because of the great space between without mounds

in similar situations, not especially probable. Very much speaks, instead, for the fact that the barrows in the mountain valleys have westerly contacts (Selinge 1976: 56) since, in Norway, mounds in similar or higher locations are known in several river valleys (Hougen 1947: 181 ff). The small number of mounds indicates, rather, that an Iron Age settlement in these locations has been temporary and perhaps conditioned by economic prosperity. Even if no reliably datable finds are known from these mounds, the incompletely documented finds which are present in the Ljusnan Valley, however, indicate that these economic conditions mainly lie within the Later Iron Age and preferably Viking Age (Selinge 1976: 56). The barrows are too few in order to be considered in the further reasoning.

5. Social models

One of the new methodical achievements within archaeology lies in the study of the source material's spatial contexts and relationships from a social and economical point of view (Redman 1973: 11 ff, Ellisson & Harris 1972: 914 ff). It concerns, then, according to a definition "the location and arrangement of sites and the economic and social structure of the society to which they belonged" (Renfrew 1973 B: 15). As a compliment to the basic ecological aspect, Renfrew characterizes this method as "the study of the social environment" (op.cit.). Often this type of reworking begins with an intensive 'site analysis' and is widened, thereafter, to wider social and ecological frameworks (for example Clarke 1972 B: 801 ff). This possibility is not available for applying in today's research situation within any of the three cultural systems in the Ljungan Valley, since completely investigated sites are lacking within all these. "Settlement patterns" may, however, not be studied only on the site level but also from a more general, "zonal", "areal" or "macro-cosmic" point of view (Trigger 1967: 54). These two levels may be valid both for the fundamental ecological and for the now current social aspect. More surveying methods for territorial analysis, which mainly build upon geographical ones, have been used in order to grasp the prehistorical societies' social organization (for example Jarman and Ellisson & Harris 1972). A method often used in these cases is also - especially concerning the hunting cultures - to use analogies to recent primitive cultures, since many of the human-ecologically and sustenance-economically conditioned social basic principles must be common (Lee & DeVore 1968, Binford 1972: 59 ff, Gräslund 1974 B with op.cit.). Such analogies are, then, examples of Binford's second analogy criterium that "in the absence of the above demonstrated justification (that is to say, continuity), relevance could be justified by seeking analogies in cultures which manipulate similar environments in similar ways" (1972: 36). Fundamentally related ways of thinking have earlier in Scandinavia been introduced above all by Gjessing (1951: 229 f).

5.1 HUNTING AND GATHERING SYSTEM

The hunting culture's social system in the Ljungan Valley is, in today's research situation, available only through general considerations originating in the number and localization of dwelling sites and through analogies to

other hunting societies. The most relevant points of view may be collected under the concepts habitation and population.

5.1.1 Habitation aspects

Above (4.1.2) it has been established that the length of the dwelling sites within the Rätan-Klövsjö area does not seem to show any systematical variations, which could be interpreted as depending upon the functional unit's size. From a social viewpoint, however, this factor - that is to say, the site of residence, which in a closed chronological context was used by a defined social group - is of exceptionally great importance. At least one such unit - or in the normal case with security always several such units - must be found implicitly in each registered operative dwelling site (compare 4.1.2 above), but it is objectively completely unavailable for a yet unexcavated material. Even upon investigation by excavation of the hunting culture's accumulated dwelling sites in Norrland, it is rare that spatial limitations in a vertical or horizontal direction can be made within such units. To this is added that almost no dwelling sites in Norrland are completely excavated and that the selection of the partially investigated ones are rather arbitrary (Baudou 1977: 25).

As a theoretical model shall, however, a reasoning be here carried out concerning the number of dwelling sites in the water system of Klövsjön-Lännässjön-Fotingen, even though only a couple of dwelling sites at the outflow through Skålsjön are investigated there (Sundlin: Klövsjö nr. 21-23). A reasoning around the Klövsjö system's dwelling sites require, therefore, an analogy to a similar dwelling site environment with more excavations. As such an analogy is here used Lake Ockern in the Indalsälven's tributary Hårkan within Föllinge parish in Jämtland, located close to 120 km as the crow flies NNE of Fotingen. Ockern is located somewhat farther from the coast than Klövsjön but, also, somewhat farther from the mountains and on a lower level - approximately 300 meters above SL. The lake encompasses only about 3.5 km^2 in area but is delimited only through shorter streams from larger lakes, rich in dwelling sites, both upstream and downstream, which is why the environment areally is not unlike that of the Klövsjö system. Ockern is surrounded by coniferous forests on predominantly moraine soil and ecologically no greater differences might exist in the macro-environment. Ockern was surveyed for regulation during the 1950's and, thereafter, by Lars Löthman for the Economic Map in 1973 (Löthman 1978: 9 f). During the latter surveying, beisdes numerous trapping pits, 23 Stone Age dwelling sites were found. Of these, the following year, 15 were excavated by Agneta Robertsson-Åkerlund (1975), however not any one totally. In comparison with

other lakes, investigated for power station regulations, Ockern might, however, be one of the most completely excavated. Even osteological analyses exist (Iregren 1975).

Robertsson-Åkerlund has compiled data from the excavated dwelling sites in a table (1975: 14 f), from which comparisons concerning surveyed and excavated data, to a certain extent, may be made - above all concerning the extension of the dwelling sites. The surveyed length corresponds to the distribution of fire-cracked stone along the beach. The size of the sites observed at excavation lies, on the other hand, in the area immediately above the scarp in the bank or inside of the line of vegetation if a developed bank is lacking. Seven dwelling sites were determined as apparently completely eroded and appeared even after excavation mainly as concentrations of flakes and fire-cracked stone on the beaches. One may not, however, completely omit that certain of these even originally may have been located on the beach (for example dwelling site nr. 13 with rich concentrations of fire-cracked stone) or that other very sparse appearances in the banks may be the result of highly limited or sporadical residences (for example dwelling site nr. 63 with few and scattered finds above the scarp). Of greatest interest in this context is the conditions of the definitely limited dwelling sites. The surveyed length for these varied between 15 and 200 meters, in addition to which only two were visible through appearances at different points. The observed length, determined through excavation varied, on the other hand, between 10 and 55 meters (Fig. 19). The separate dwelling sites - according to the second dwelling site concept above (4.1.2) - appears within the registered ones during excavation as dense areas in frequency of finds and fire-cracked stone. The two longest surveyed locations were each made up of three smaller dwelling sites and the third longest of two, while the other surveyed surplus lengths had appeared through distribution of material from one dwelling site. In some cases (for example dwelling sites 11, 14 and 17) it is, however, not impossible that unimportant find concentrations between or beside of dense areas may indicate still more residences. In seven cases the width had also been noticed as being between 10 and 20 meters in from the present-day scarp. That should be considered as a minimum measurement since parts of the dwelling sites, in almost all cases, probably were eroded away. For the ten dwelling sites, where the surface extensions under these premisses were given, it as a rule varied between 100 and 400 m^2. In one case it was, however, 600 and in another 1100 m^2. Of the two latter, one (nr. 15 B) was probably completely preserved and the other (nr. 11 S) may, judging from the plans, probably be two dense areas. Several of the smallest (for example nr. 17) seem, by judging their location, to be partially

eroded away, why the original size in these cases probably can have been up to 2-3 times larger than that of the present-day. An approximative estimation of the dwelling sites' original size in Ockern - that is to say, still according to the second dwelling site concept above - should, according to these premises, fall between 200 and 700 m^2. Because of the erosion damages and, in all the cases, the incomplete investigations - however as a rule with well delimited find areas - these numbers are partially subjective. Repeated sojourns may also have brought about unmeasurable location displacements, that is to say increases in size. I, however, judge it probable that all the dwelling sites here, from a social viewpoint, are equivalent, that is to say represent an unknown number of equivalent residences by equivalent groups of people (compare Gräslund 1974 B: 6 with op.cit.). How many sojourns each dwelling site corresponds to can, however, not be determined, neither by the preliminary datings that are available (Robertsson-Åkerlund 1975: 14) nor in any other way.

The model for interpretation of the surveyed values of the dwelling sites that Ockern offers, I consider applicable also on the uninvestigated number in the Klövsjö system, since the lakes are similar in location, geological-topographical prerequisites and human-ecological conditions. One of the three investigated dwelling sites in Klövsjön has given measurements (Sundlin: Klövsjö 23), and it has also comparable values. All of the dwelling sites and other ancient monuments of prehistoric character have been plotted onto a map over the lake system (Fig. 20). Trapping pits appear as is seen near the inflow and the outflow on the N part and in some cases near the straits between Klövsjön and Lännässjön. The total number reaches, however, only to 92. The occurrence of graves is limited to three stone settings with stone filling on a point with a dwelling site in the E part of Fotingen. The number of surveyed dwelling site locations reaches 61 and they have, which is seen, a highly uneven distribution within the lake system.

The lengths, registered at surveying of the Klövsjö dwelling sites, is included in the above mentioned diagram (Fig. 10), where Klövsjö's 61 dwelling sites have a representative distribution over the whole scale of 190 dwelling sites. Of the 33 dwelling sites that are 200 m long or more, 12 lie in Klövsjö. I am inclined to generally interpret the length relationships of Ockern's surveyed and excavated dwelling sites so that all dwelling sites with a surveyed length of more than approximately 50 meters normally consist of several dwelling sites, according to the second dwelling site concept above - that is to say, accumulated dense areas which originated in repeated residence sojourns that cannot be separated. In extreme cases, however, be-

cause of currents, ice movements, etc. unusually long sparse distributions of fire-cracked stone out from one dense area may appear. At registered dwelling sites with extremely long extension - for example the above named 12 in Klövsjö with over 200 meters length - this length is usually comparable to a corresponding number of dense areas. At long, very thin distributions - above all in storm banks washed ashore - one must, however, count on exceptions also from that rule. A measure of the noted frequency of fire-cracked stone would, therefore, be worthwhile for appreciations in these respects.

Upon surveying the appearance of fire-cracked stone is empirically given after a subjective scale: sporadic, sparse, moderate, rich and very rich (Selinge 1978: 3.1). Usually, in this case, for longer dwelling sites, variations in distribution within the dwelling site and appearance of several concentrations are noticed. A more careful registration would, of course, be desirable for a general division of the surveyed number in dense areas and possible functional units, but such a registration should require an extensive reinspecting in the field. Tentatively, a division of the dwelling sites in Klövsjö from the field notes is, therefore, applied here. All of the sites up to 50 meters in length are, by this, taken for one dwelling site - still according to the second concept above - after which the mentioned principles are applied. In that way, the material can be divided into just more than 110 units which, roughly figured, may be seen to correspond to a doubling of the number in comparison with the registered locations - that is to say, the third dwelling site concept according to the above. That number ought, in any case, to give a slight indication about the general size of the number of dense areas of dwelling sites, which should be met with during a total excavation of the surveyed number in the whole lake system. It is greatly underestimating, since the surveyed average length becomes approximately 65 meters - chiefly depending upon some extremely long locations with predominantly sparse distribution. The number is then to be seen as a minimum value.

How many temporary residences - that is to say, "pure" dwelling sites according to the first concept above - this value should correspond to one can, on the other hand, hardly have any well-founded idea of, since different types of activities and different chronological permanency may have left considerably different amounts of material. The dwelling sites show, therefore, surely large variations in that respect. Should every dwelling site on the average have been visited approximately 10 times, the number of imaginable residence sojourns in the lake system becomes approximately 1100-

1200, for 20 times it becomes 2200-2400, for 30 times 3300-3600, etc. - all examples of fully imaginable values. It should indicate still another complication, if one or more functional dwelling sites had a considerably larger areal, since they might have been used by a larger social group (Newell 1973: 402 f). I find it hardly probable that this should have been the case, but one cannot ignore the possibility - for example at the Klövsjö straits.

Of great importance for the understanding of the social contexts is also the question of how many dwelling sites may have been visited simultaneously. This question is - except on the population density - dependent upon the maintenance economical system and its exploitation of the environmental resources. These may, under the prerequisite that it is a question of a pure hunting culture, be equaled with the natural biological production of the environment. Judging from parallels with recent hunting cultures one ought, however, not to presume a maximal extraction from this. An equilibrium in the relations between population and carrying capacity on a considerably lower level appears, namely, to mean the optimal adaptation to the natural environment (Birdsell 1968: 230 f, Lee & DeVore 1968: 11, Sherratt 1972: 482 f with op.cit., Binford 1972: 435 f, compare Clark 1975: 24 f). That ought to imply that the lower under the upper resource limit the exploitation lies, then the greater area is required in order to support a given population group within a given environment. An advance toward the limit may take place through population increase within the group or an increasing density between similar groups, and a widening of the limit may take place through a change in the maintenance economical pattern. The distance to the limit gives operating room for changes in the environment with retained stability in the system. The usual is, therefore, for a purely hunting environment an equilibrium, while changes may appear relatively seldom but by leaps (Sherratt 1972: 487 f, Binford 1972: 297 f). The group's size is, therefore, also stable at different levels (Birdsell 1968: 234 ff, Helm 1968: 120, Lee & DeVore 1968: 11 and 245 ff, Price 1973: 465). I presume that these ethnologically evidenced, general principles have been valid also for the Ljungan Valley's hunting culture and that the lowest level of group size that usually is considered to lie between 15 and 50 persons, is applicable.

Besides group size and environmental resources the possibilities of communication are also of importance for the size of the area which normally was exploited from a dwelling site. This "site exploitation territory" has been defined as "an area round a site habitually exploited by a human group" (Jarman 1972: 708) and has also been named "catchment area" (Ellisson & Harris 1972: 915 with op.cit.) or "home base territory" (Clark 1975: 13).

The radius in that area may schematically be seen as a function of the relation time/energy (Jarman 1972: 710) and changes, therefore, according to topography. It ought, in principle, to be seen to correspond to, at a maximum, one day's movement back and forth with consideration to necessary time for the intended activity. It makes up, then, an application of "the principle of least cost" (Redman 1973: 13). After investigations at, among others, the bushmen and Australian aborigines a radius of approximately 10 km is often given as normal for a site exploitation territory of a hunter's dwelling site (Jarman 1972: 706 with op.cit.). Parts of the circumferences for catchment areas with that radius have been laid out for each dwelling site in the Klövsjö lake system in Fig. 21. The circumferences have been marked only for the lake and its nearest vicinity. A possible adaptation of the catchment area to the topography has been exemplified for the centrally located dwelling site on the Lännäs promontory (Klövsjö nr. 6). An adaptation to the mountain steep in the W is natural within the frame for a day's journey but, otherwise, it is fully possible that the distance may be greater than that marked - especially along the water course. It may, however, be seen in the model, that the dwelling sites already with that radius exclude each other in the lake system. *One* dwelling site ought, then, to have been used at a time in the whole lake system in order that conflicts should be avoided and so for an optimal resource exploitation (compare Baudou 1977: 133).

The conclusion of this statement is, then, that *one* social group successively and repeatedly exploited the lake system for residence in connection with its search for nourishment. The hunting society's basic principles of *small* and *mobile* groups ought to have been valid (Birdsell 1968: 234 ff, Lee & DeVore 1968:11). "The primary subsistence unit then is the minimum group of individuals that co-operate in subsistence activities for the major portion of the year" (Price 1973: 467). The concentration of dwelling sites to certain locations means that these, from a nutritional and/or residential viewpoint have been more suitable than other. That concerns, in this case, firstly the straits between Klövsjön and Lännässjön. Reasonably, that ought to depend upon that these offered the best combination between different nutritional sources - that is to say, hunting, trapping, fishing and gathering - and, in addition, good residence conditions. The residences' permanency and the intervals between them are still undeterminable. That they have had a seasonal character one may, however, judging from archaeological and ethnological parallels, assume. It is reasonable even here to count on that the group made use of an "annual territory" - that is to say a more extensive area, which was exploited during the course of a yearly cycle (Jarman 1972: 709 f, Clark 1975: 13 f). Which season or which seasons within this cycle the Klövsjö

lake system's dwelling sites represent are, in the absence of excavations, however unclear. The location makes a parallel with Ockern applicable. There, bones from young calves are lacking in the elk bone material, but one cannot with security verify during which season hunting took place (Iregren 1975: 17). A layer of fire-cracked stone has been interpreted as a possible winter residence (dwelling site Föllinge 10, Robertsson-Åkerlund 1975: 35). Hotingsjön with, among others, the large wall of fire-cracked stone near Bellsås also lies in a similar environment. Within the wall of fire-cracked stone there appear winter residence (Baudou 1977: 98), and it is possible that these constructions generally may have a relationship with that season (compare Selinge 1978: 3.5). In Ljungan there are, however, only five smaller similar constructions known - three at Rätansjön and two at the Lower Grucken. A definitive indication of residence - or perhaps hunting expeditions - during another season give, until further,only the few dwelling sites in the mountain chain, where summer hunting appears ecologically reasonable. Probably, there are further a considerable amount of such dwelling sites. It may not be excluded that locations in these positions could have been used by smaller "task groups" for special purposes, which, among others, is evidenced by the Canadian Indians (Helm 1968: 118 ff) and in the European Mesolithic (Newell 1973: 402 ff). If seasonal mobility is annually repeated, the above named numbers of possible residences also give alternative minimum limits for the time period during which the lake system may have been used. The total scope in this respect may, however, be considerably greater.

5.1.2 Population aspects

The probably homogeneous size of the original, functional dwelling sites must have a clear connection with a relatively stable population within the social group which exploited them. The above named size numbers in Ockern within the frame 200 - 700 m^2 are probably somewhat too wide for one single, chronologically limited place of residence, since it ought to be difficult to reach complete spatial congruency for repeated sojourns at the same place. In addition, the distribution of rubbish even at one single residence ought, to a certain degree, to take place even outside the real area of habitation. In consideration to this, instead, an area within the frame 100 - 400 m^2 may be used as a calculating basis. In a stock of mesolithic dwelling sites 240 m^2 was the smallest area of that character (Newell 1973: 405). According to anthropological experience, approximately 10 m^2 ought to be an average area needed for one individual on a hunter's dwelling site (Newell 1973: 405, Gräslund 1974 B: 6 with op.cit.). The suggested spaces should normally, then, be able to have room for 10 - 40 persons. With consideration to the wide margins in the calculations, these values agree fairly well with the

anthropologically established approximate value of c. 25 individuals in comparable groups (Birdsell 1968: 235, Lee & DeVore 1968: 11, Price 1973: 465, Newell 1973: 405, Gräslund 1974 B: 4 f). This socially normal group unit would correspond to 2-5 nuclear families. The values also agree with the areal size and individual number of the totally investigated English mesolithic dwelling site Star Carr and with dwelling sites in N Ångermanland which were compared with this (Clark 1972, Baudou 1977: 131 f).

A group of 10 - 40 or, on the average, 25 persons should, under these prerequisites, have exploited the Klövsjö lake system during at least one period of unknown length within a probable annual cycle. Another period - probably shorter and possibly only for a part of the group - one may have spent in the present-day mountains - that is to say, both within the Oviken Mountains and the Klövsjö Mountains. The distribution of trapping pits indicate that hunting expeditions - believably of "task groups" - may have been undertaken also within larger parts of the woodlands. Where an eventual, but probable, third season may have been spent is more uncertain. The strayfinds in the lower river valley represent, with greatest probability, also dwelling sites, but it is unknown if these have had the same size. Some of these may have been coastal dwelling sites by the *fjords*, which still during the Neolithic period deeply penetrated into the present-day river valleys, or in the contemporary archipelago. A third period in the cycle may, therefore, have been spent at such locations, where, among others, seal hunting of the type which is evidenced at the dwelling site Överveda in Ångermanland and in Västerbotten may have been of importance (Baudou 1977: 42 ff, Christiansson 1974: 27, 31).

As a fundamentally relevant, but in detail greatly divergent parallel, one may mention the arctic, N Scandinavian hunting environment. For this culture it may be calculated that during the Neolithic period at least 2-4 seasonal stations can have occurred annually (Gjessing 1955: 87, Simonsen 1965: 401 ff). Here exists, however, the climatically conditioned, important difference that the winter residences lie near the open sea and may have had considerably greater population. The group size may, therefore, probably have been flexible, not allowing any pronounced social or political organization (Gjessing 1955: 88 f).

With regard to the uncertainty which still exists concerning the seasonal distribution and the unclarity concerning the dwelling sites in the lower valley and near the coast, one ought at an attempt to population census, in today's research situation, to proceed only from the best known dwelling site

area near the lake systems above the highest coastline. For reasons of ancient monument quantity - which concerns the hunting culture of Norrland in general (Selinge 1978: 3.4) - I consider this zone as the most important for interpretation of the hunting culture's system (compare Hvarfner 1957 B: 108). If the Klövsjö area is considered as a normal home base territory for a social unit during a certain but yet undefined part of the year, a number of similar units may be pointed out within other parts of the inland forest areas. One area of this kind ought to be located around Storsjön with bordering lakes in the valley's upper part, where probably considerably more dwelling sites than those now known may exist. To this social and spatial unit are the only, to date, known mountain dwelling sites connected. It is not either excludable that this unit may have had coastal contact westerly, since the watershed to the river Nean is located in the low bare mountains S of the Helags Mountain, an area which probably was forested during the warmer period (Lundqvist 1969: 187 ff). That river runs out into the Trondheim's *fjord* only approximately 120 km as the crow flies from the watershed.

A quite similar unit to that in the Klövsjö area ought to have exploited the valley around the lake system Hålen-Nästelsjön-Rätansjön, rich in dwelling sites. In this valley also communication toward the N and the S to other river valleys - that is to say, the Storsjö area in the river basin of Indalsälven respectively the Ljusnan Valley via the tributary Hoan - is probable because of the short distances and easily traversable terrain. One group may have had the Handsjön-Havern area as a home base and another Holmsjön in Haverö with downstream bordering lakes, without being able to draw any clear delimitation between these. The Gimån Valley ought, lastly, to have presented prerequisites for at least two similar units - one in the upper part around Revsundssjön and Bodsjön and other lakes, and one in the lower part with, among others, Holmsjön in Holm parish and the slack waters in SE Jämtland. Both of these are, however, in today's situation unknown because of the lack of surveying. The first named of these are situated near to the Storsjö area in central Jämtland and the latter may probably have had contacts with the discharge bay of the Indalsälven.

If one assumes that the folk groups of these presupposed units also left the stray finds and the supposed dwelling sites in the lower valley and near the coast, these at least seven units might be used for a hypothetical calculation of the population of the pure hunting culture in the Ljungan Valley. With the probable population of 10 - 40 individuals per unit the whole population ought to lie between the values of 70 and 280 with a probable mean around 175 individuals. Distributed within the whole valley's 12 850 km^2 should

these minimum, mean and maximum values give a population density of 1 individual per 184, 73 respectively 46 km^2. These numbers agree very closely with three examples from modern, hunting/collecting Indian tribes in the Canadian forest areas, where the numbers were respectively 160, 75 and 50 km^2 (Price 1973: 459 ff). The difference in the population density for these have been suggested to depend upon "the relative abundance of game" (Price 1973: 465 with op.cit.). The result and the analogy ought to indicate that the calculations from a social-functional viewpoint lie on a realistic level. It also supports an earlier assumption that the analogy is fully applicable in N Scandinavian forest conditions during the Atlantic/Sub-Boreal period (Price 1973: 470, Gräslund 1974 B: 7). I am, therefore, inclined to interpret the concordance with the Ljungan Valley in such a way that the valley is representative for Norrland. Alternative calculations - stemming from other approximations in the size of the dwelling sites - are, therefore, hardly meaningful. Further, I consider that the example implies that the predominance in the extension of the dwelling sites for the woodlands above the highest coastline in Norrland in general (Selinge 1978: 3.4) not only is a result of the unevenness existing today, when it concerns surveyings, but have an actual, cultural background. The Norrlandic hunting culture's home base territories may generally be located within these areas, while higher and lower located parts of the landscape are included in the annual territories. This fact, of course, does not exclude that new surveys in the latter areas should give good results. For the Ljungan Valley the result may be summarized in the model Fig. 22. The borders between the mobile units are, of course, only fictive, and in reality probably the whole river basin has been more or less exploited. As has earlier been mentioned, the distribution of the trapping pits may be considered as an indication of such an exploitation.

Anthropological source material indicates that a number of social primary groups of the type dealt with here also were losely organized or, in any case, grouped in larger, secondary units, which can have been 10-20 times as large (Price 1973: 469, Birdsell 1968: 233). These have been necessary for, above all, biological-genetical reasons. One has meant that these "tribal units" also spatially corresponded to single, considerably larger dwelling sites (Newell 1973: 403, Gräslund 1974 B: 6), which may have made up temporary meeting places. Within Middle Norrland the large dwelling sites at Överveda, Hälla and Nämforsen have been pointed out as such places (Gräslund 1974 B: 8, Baudou 1977: 137). Within the Ljungan Valley no such place may be pointed out in the present-day source situation. The concentration of dwelling sites. which might mostly resemble such a tribal site, is the above

named straits in Klövsjön but these may, as mentioned, also include an unusually dense concentration of a primary group's dwelling sites. The difficulty of nominating a central place does not prevent that the accepted seven primary groups made up or were included in a greater tribal unit. One may, however, very well imagine that such a unit operated without one single central place. Two or several primary groups may, for example, have met one or several times each year in connection with their wanderings. If all the groups at some time annually visited the coast, similar meetings have been nearly unavoidable - especially if the wanderings took place only within the river basin. That an exchange of both marriage partners, experiences and probably to a certain extent wares - for example imported flint - took place between the primary groups might be taken for granted, apart from this taking place within a more organized larger unit or a more temporary one. One has also maintained that a similar, flexible system is the optimal one from an ecological viewpoint (Lee & DeVore 1968: 12). Among others, an exchange between the primary units is necessary in order to keep the groups' effectivity, in order to master variations in the food supply and in order to avoid a too strict dependence upon a limited environment.

If, during the hunting culture's long time periods, any more deciding changes took place in the way of exploiting the environment's resources - for example for production - such a change may also have influenced the population number. Such a change may be the introduction of elements from a pastoral or agrarian economy. As mentioned above (4.1.2) similar changes have been recently evidenced during the Neolithic and Bronze Age in different areas in Norrland. In the Ljungan Valley there are pollen analytical indications partially near the coast of that time during the Middle Neolithic period and partially in both the coastal land and the inland during the late Bronze Age (Engelmark 1978: 45 ff). Clearings for grassland appear to be surely established although probably of modest extent, while cereal pollen grains only appear sporadically. If these elements of a subsidiary livelihood to the hunting culture in any deciding or enduring extent could have influenced the population is unknown. It is, in any case, hardly believable before the Bronze Age within the areas above the highest coastline, basic for the above calculations. It is fully possible that the cultural system responded to these stimuli, which at least during the periods before the latest Bronze Age were probably of modest extension, with adaptations within other parts of the system in order to maintain a reached equilibrium (compare 3.2 above). Such reactions may, for example, have had the character of population-regulation actions in order to maintain the mobile pattern and the experienced economical basic structure (Birdsell 1968: 236 ff, Gräslund 1974 B: 2 ff). The population

amount has, on the whole, probably never been so large - or been permitted to become so large - that one has not had good margins to the environment's potential possibilities of offering support (compare 5.1.1 above).

5.1.3 The grave problem

To the Mesolithic period reliably evidenced graves are extraordinarily few in number in the whole country (Stenberger 1964: 41 ff, Clark 1975: 146, 197 f). A sensational Danish find of a whole cemetery from the Boreal period, located on a contemporary dwelling site (Albrethsen et al. 1976: 6 ff) suggests, however, that graves may have existed already during this early hunting culture to a greater extent than what now preserved or known finds indicate. Within the Baltic area, yet a couple of mesolithic cemeteries in N Latvia and near Lake Onega (Zagorskis 1973) may be mentioned. Single graves are also found in Finland during the Mesolithic (Luho 1967: 104).

The Sub-Neolithic Stone Age cultures in S Scandinavia - above all the Pitted-Ware culture - have likewise graves within the dwelling sites. These are best known within areas where the conditions for preservation of bone are especially good (Janzon 1974), but they are known also in other locations (Welinder 1971: 85 ff). Within the Finnish area there are graves on dwelling sites within fundamentally similar cultural groups within the comb-ceramic circle which, however, partially are somewhat older (Edgren 1966: 90 ff). All of these cultural groups have graves with inhumations, probably even originally wholely without visible constructions above ground. Within the graves that probably belong to the Jäkärlä group (Edgren 1966: 96) the corpses are lying in cists - at least nowadays under flat ground - while the typical comb-ceramic (Edgren 1966: 95) and the pitted-ware graves, as a rule, lie in simple trenches which, in certain cases, have had constructions of stone or organic material (Janzon 1974: 15 ff). The dead may either lie in a supine or in a squatting position (Janzon 1974: 23 ff), and the graves may both in the Mesolithic and Sub-Neolithic be strewn with red ochre (Edgren 1966: 90, Albrethsen et al. 1976: 7, Welinder 1971: 86). The burial custom, as a whole, has many parallels towards the E (Edgren 1966: 100 ff). In Finnmark's Stone Age there are single graves for buried corpses in low cairns beside the dwelling sites, preferably from the culture's later periods (Simonsen 1970: 21 f), and probably also burials in simpler forms have existed. These graves have examples of definitely dated stone artefacts down into the Iron Age (Gjessing 1942: 363 ff).

With exception of a unique cist grave which resembles these of the Finnish group (Baudou 1977: 45 ff), no graves are known in Norrland which with absolute

security may be dated to the Stone Age or attributed to a hunting culture, carrying stone artefacts, of the kind which is evidenced on the inland dwelling sites. One has questioned (Christiansson 1969: 63 f), that an unrecorded bone find on a dwelling site in Sorsele parish, Lappland, should be a grave find, likewise in this context a probable deposit find in red ochre from Lillhärdal, Härjedalen, has been named (Janzon 1962: 37 f). A similar find from the Ljungan Valley can, because of the find conditions, hardly be a grave find (Selinge 1970: 23, Baudou 1977: 104).

Ordinarily one considers, owing to the lack of graves, that a burial tradition on the whole was not known within the Norrlandic hunting culture, before the cairn burial custom during the Bronze Age was established along the coastline (Baudou 1977: 138). Even the unique cist grave in Lagmansören in Indal lay -especially if Baudou's dating is correct - in a coastal location near a bay. The possibility that several similar graves without visible remains may appear, of course, exists but they might never become usual. In this connection it may also be recalled that Norrland has a relatively large number of finds of axes belonging to the Swedish-Norwegian Battle-Axe culture but lack its typical grave finds (Malmer 1962: 630, 655 ff and 1975: 80 f, 115 and 153). Possibly that may be seen as an indication that the axes may be imported to the hunting culture even if that is considered improbable (Christiansson 1965: 98 f with op.cit.). Also in this case undiscovered grave occurrences are thinkable.

The lack of a certified burial tradition does, however, not necessarily mean that religious or memorial customs concerning the taking care of the dead were lacking. The lack of ideal remains does not, then, mean that the ideas themselves were lacking - only that they were expressed in such a way that the remains were not preserved until our time. Such an hypothesis is, of course, difficult to verify but some fundamental and analogical considerations shall here be tried. Even in this case one may be reminded of the disposal of the dead in later hunting or nomadic cultures - partially within the area of Norrland and partially within other cultural circles.

Binford (1972: 208 ff) has on a theoretical level inspected the relationship between variability in burial tradition and the society behind. One conclusion is that cultures with "settled agriculturists" have several dimensions in the society mirrored in the burial tradition than cultures with "hunters and gatherers, shifting agriculturists and pastoralists". The greater variability of the first lie mainly on the social level (op.cit. 230 f). A general conclusion is, "... that the form and structure which characterize the

mortuary practices of any society are conditioned by the form and complexity of the organizational characteristics of the society itself" (op.cit. 235). From that viewpoint, then, the grave poverty in a hunting culture is normal. It is said that change and stability do not in the first place depend upon the "ideational innovations and communicated knowledge or ideas" but on the culbural system in its entirety and its structural validity. "Human behavior in the context of a cultural system" is differentiated and manifold, which is why this also includes "the disposal of the dead" (op.cit. 237). Similar forms and traditions are not considered to depend upon cultural mixture and hybridization but on the fact that systems have analogous development processes in similar environments. In principle, that is a similar attitude - or one of the possible attitudes - which Renfrew arrived at with the starting point in the radio-carbon revolution (1973: especially page 109 ff and 252 f). The degree of complexity and differentiation in the society influences, then, the appearance and variations in frequency and distribution of the grave construction's tradition and burial custom (Binford 1972: 239). These observations do not, of course, constitute any evidence for that absence of burial traditions might not appear in uncomplicated societies, but if they are valid such an absence must undoubtedly be considered less probable.

Hultkrantz (1965) has from the viewpoint of history of religion expressed a completely analogous approach to the northerly hunting cultures. "The religious pattern expresses an ideology and a value system which refer to existing conditions in a society based on a certain type of ecological adaptation" (1965: 279). He also maintains that the most original pattern within these areas more recalls a boreal inland environment than an arctic coastal environment (op.cit. 287 ff) and that from a broad religion-historical viewpoint it is possible "to view all the Arctic hunting cultures as important relics of the old paleolithic and mesolithic hunting cultures in Eurasia and Africa" (op.cit. 293). This environmentally conditioned hunting cultural religion is valid for a number of comparable northerly cultural groups, and even the Lappish religion is built upon a boreal hunting tradition (op.cit. 300). Religion is dominated by hunting ideas (op.cit. 302 ff), while burial tradition is modestly appearing although adaptively varied (op.cit. 312 f).

Against that background one may as an historical parallel from Norrland unsought remind of the difficulty to verify early graves, which with absolute certainty may be attributed to the Lappish or proto-Lappish population (Zachrisson 1976: 13 and 92 ff). At present, the oldest known surely dated Lappish grave is as late as from the later Middle Ages (op.cit. 92). Characteristic for the Lappish burial tradition is the changing and often seemingly

occasional and unpermanent disposal of the dead in natural cavities in rock or boulder formations, in cobblestone or cairn-like accumulations, in *ackjor* (Lappish sledges), trunks or other wooden constructions or in pits. Such grave places are known both in older sources (Manker 1961: 37 ff), related in the oral tradition (Manker 1961: 54 ff) and registered in the field (Manker 1961: 175 ff). Even if the last mentioned belong to the Christian time, the variation itself, the lack of established customs and the difficulty in verifying older graves indicate that even under heathen times the graves were modestly marked, richly varying and without real built markings. That in any case during historical times ideas of death in spite of that have not been lacking is clearly established in the ideal world, which is illustrated on the Lappish trolldrums (Manker 1961: 16 ff). If the, at present, from an archaeological viewpoint, most probable hypothesis about a Lappish - successive? - immigration during the Bronze Age and earliest Iron Age is correct (Baudou 1974: 45, compare 6.3.3 below), it also seems probable, that similar or related burial customs and ideas of death were prevalent during the whole of that time within a Lappish or proto-Lappish population. The cultural ecology was, however, completely similar also before this supposed immigration, which is why similar burials may have appeared even earlier. It ought to be recalled that these customs as far as is known today in historical times did not include cremation burials. One may, in this context, also recall the considerably more numerous, partially built graves in the Lappish Iron Age culture with a stone technology in Finnmark (Simonsen 1967: 70 f and 1970: 24 f, Kleppe 1977: 34 ff). They can have a construction similar to the Swedish ones but also be made as a stone cist in shore walls or low cairns. From the Middle Ages here also appear in the inland examples of cremation burials in small cairns, where the corpse was cremated in the place, but most graves have also here the more temporary construction usual for Lappish graves.

Both these general religious-ecological principles and the special Lappish conditions I judge to indicate a verification of the posed hypothesis on the reasons of probability, even if it is not conclusively established. Disposals of the deceased may then have existed in the Norrlandic hunting culture disregarding its ethnical foundation but might have been of that varying, adaptive and perhaps temporary kind that any grave constructions, only in exceptional cases, may have been preserved into and observed in our time. As a very arbitrary and stretched ethnographical parallel, one may be reminded of the richly varied disposal of the dead among the Australian aborigines, which did not always express itself in a real burial custom

(Haglund 1976: 32 ff). It has not either always been possible to confirm in agreement between archaeological and ethnological sources.

The graves at the inland shores may, traditionally, be seen to represent a radical new orientation in that environment, since they ought to be considered as representing a new religion (compare Baudou 1968: 104 f, Selinge 1976: 69). If, however, religious ideas of death and with them related disposals of corpses are possible already from early times, the visible grave monuments' appearance during earlier Iron Age does not with necessity need to be interpreted as a new religion. To the already previously varied patterns for the deposit of the corpse is in such a case laid only a new - rather a technical innovation for a permanent grave construction and a new burial custom. It is, namely, not excluded that earlier traditions may have meant, from the viewpoint of the survivors, a fully sufficient permanency in another design. The new variation in the cultural ecological pattern may, then, imply a response of external cultural stimuli, but also an adaptation to internal, environmental or social changes. Depending upon how radical the changes were they may, from a systems theoretical point of view, be seen either as an adaptation within the system in order to preserve a reached equilibrium or as a treshold effect in order to reach a new, when the frame for the older was destroyed. "When new ecological demands appear, this (religious) pattern is shattered, or modified to establish a new equilibrium" (Hultkrantz 1965: 279).

I have, in another context, pointed out possible diffusion directions for an imaginable external distribution of ideas, which might explain the appearance of the lake graves (Selinge 1976: 70, JBV: 401). An internal environmental change may, however, according to the alternative presented here be considered as a fully possible reason. This might, for example, stem from the ecological changes which were brought about from the climatic deterioration during the early Iron Age (Lundqvist 1969: 191, Engelmark 1978 B: 7). Even if both the burial custom and the grave construction's tradition during the earliest Iron Age might be explained in a traditional archaeological way most easily through the diffusion of ideas (Ambrosiani unprinted), already the acceptance of these new signals within the hunting culture's area may have a relation to the environmental changes. The available C 14 datings of the cemetery at Krankmårtenhögen, the central figures of which lie between 380 B.C. and 95 A.D. (uncalibrated values, Ambrosiani unprinted) are, therefore, interesting in this connection. That this renewal within the hunting culture's area also cultural-ecologically lies within the pure hunting culture is evidenced, in my opinion, by the above mentioned

rich deposits of elk antlers on the graves. That it may not be influenced by the farming culture within the valley is evidenced by the fact that the beginning of this - as is known today - are at least 300 years younger than the earliest graves at Krankmårtenhögen (JBV: 242). Therefore, the cemetery does not either necessarily - under the prerequisite of an adaptive cultural ecology - "signify that small groups of people from the south broke into the purely hunter-fisher culture areas" (Baudou 1978: 20).

It appears probable that also the scattered stone settings, grave groups and small cemeteries along the inland shores, which, as a rule, are undated but probably usually younger - in certain cases considerably younger - than Krankmårtenhögen, belongs to the same cultural, ecological and social environment as this cemetery. The definitive division into two groups with larger cemeteries respectively smaller grave groups, which Baudou assumes (1978: 20 ff), is, namely, not so marked as his presentation may give the impression of, neither in a morphological nor a chronological respect. Many smaller cemeteries appear (Hyenstrand 1974 B: 181 f, Selinge 1976: 42), and the large cemeteries in Härjedalen were also judged as small prior to the investigations (Hvarfner 1962: 156, Ambrosiani unprinted). Baudou suggests, as mentioned above, several possible combinations of subsistence in order to explain the appearance of the lake graves (1978: 22). A definite attitude is still hardly possible, but I do not consider that the paleobotanical investigations in Haverö decidedly evidence that "the essential subsistence was always based upon agriculture and/or pastoralism". Ambrosiani (unprinted) also judges the cemetery's relationship with the hunting population "as the most probable of the different possibilities". Compare even 4.1.4 above concerning the interpretation of the paleobotanical sources.

If the cemeteries and the single graves were raised over hunters, one may question whether the adaptation of this burial tradition marks a change of the social evaluations in the hunting society. In a summary of the hunting societies' general characteristics, one has, because of their mobile character postulated "a generally egalitarian system" (Lee & DeVore 1968:12). The number of graves and the time for Krankmårtenhögen cannot correspond to a robust total population of the primary group size (Ambrosiani unprinted), which might be interpreted as a selective burial tradition (compare JBV: 347 f), that is to say a non-egalitarian system. Above the hypothetical possibility that a non-documented 'disposal of the dead' has existed within the hunting culture has been judged as possible. A similar custom may, therefore, have existed also simultaneously with the lake graves without meaning that these solutions necessarily - but possibly - have had different social

values. The small number of cemeteries is still a further indication that they do not represent a complete population. The graves are according to this interpretation, therefore, not suitable for population calculations.

A place like Krankmårtenhögen may, on the other hand, have had a special value or status within the territory of the hunting group in question - a grave site or sacrificial site which one returned to with more or less regular intervals. This may have taken place completely irrespective of whether the visits for food supply, which are evidenced in the Stone Age dwelling site under the cemetery, took place only before or also during the time when the site was used as a cemetery. It seems most reasonable that the site after normal, prolonged use as a dwelling site was reserved for its new use, while the tradition of the old still was alive. This assumption may be considered supported by the available datings. The utilization as a sacrifice site may - along with the memorial use as a cemetery - have included status as a cult site of, in principle, similar but in the religious method of a different type than the sites with rock art - above all Nämforsen (Baudou 1977: 82). A central, primarily memorial function within a territory has been suggested also for the very similar cemeteries in Dalarna (Hyenstrand 1974 B: 182).

For the scattered grave groups and the single graves, a similar function is more doubtful. One form of territorial delimitation is, however, a fully possible secondary function also for a single grave, and this may then symbolize the deceased's, the clan's or the social hunting group's connection to the environment. This might explain that they always lie on dwelling sites - that is to say, in locations that evidently must have been favourable from a hunting-ecological point of view. Such a use does not, however, need to mean that a grave shall be contemporary with the underlying dwelling site. Rather, it is from a functional viewpoint more probable, that one upon the burial occasion used some other dwelling site or a possible dwelling site location within the territory. Even with this condition, however, a relative contemporaneousness between grave and dwelling site seems to be probable, but in single cases the datable finds seem to speak for a clear difference in time (Baudou 1977: 109, 1978: 19). As a rule, however, not closely datable finds are included in the find material, and possibilities for temporary visits without remaining finds also exist. In the Haverö case seems, except the mesolithic finds, flakes of a Bronze Age character to occur (Baudou 1978: 15). The grave is, incidentally, in this case untypical for the type and probably also to the time. The question of the relationship in space and time between the lake graves and dwelling sites are, at present, not

solved. It is intimately connected to the problem of the hunting culture's prolongation forwards in time and with its connections to the agrarian culture. However, in my opinion, the grave tradition does not need to be interpreted as an innovation in the hunting environment of that kind that an ethnical or economical new organization must be a prerequisite. It may, instead, imply that an adaptation and a response within the existing system's frame on ecologically, socially or culturally received stimuli.

5.2 COASTAL SYSTEM

Above in Fig. 16, the distribution picture of the coastal environment's graves has been illustrated within one of Medelpad's two most dense coastal grave areas. Of earlier published, general maps (Selinge 1973: 221 and JBV: 397) it is evident that the example is chosen in a typical coastal environment. The situation in large has been interpreted as dependent of a sea-bound subsistence system (4.2.3). The question is, in this context, whether the grave localization also may be used in order to throw light on social factors, first of all the question on the settlement unit's extension, organization and population.

5.2.1 Graves, habitation and population

Baudou has, in his investigation of the coast-bound cairn area in Ångermanland, published a number of maps of similar character as my above mentioned (1968: Fig. 27, 28, 31, 32 and p. 160 ff). With a point of origin from the partially excavated area around Sund in Vibyggerå parish (op.cit. 124 ff) he has made a hypothetical division of his area of investigation in seven settlement units, to which is added one area in Nora-Nordingrå with approximately 75 graves, which he did not consider possible to distribute on such units (op.cit. 146 ff). The normative settlement unit at Sund has a certain morphological distinction through a marked element of rectangular cairns which otherwise are unusual (op.cit. 128 f). Otherwise, there are no morphological differences worth mentioning between the grave constructions within these groupings (compare op.cit. 94 ff) and the burial custom is homogeneous within the whole area. The Sund unit has 76 preserved grave constructions (op.cit. 124) and of the others, three have 19-24 preserved graves each and three have 71-108 graves each (op.cit. 133 ff). The delimitations between the groups are difficult and, in several cases, rather arbitrary, the areas are greatly varied as well as the density of ancient monuments. The groups may, therefore, not represent comparable social or chronological realities and, in any case, the smaller must have a limitation in one or the other respect. Baudou anticipates that the four larger units correspond to a population of one extended family's size during the greater part of the

Bronze Age (op.cit. 148). The smaller units are interpreted obviously in the first case as chronologically delimited (op.cit. 133, 138, and 143 f), even if unambiguous evidence for this is lacking in the level relationships or finds.

In order to satisfactorily analyse the question of the settlement units' delimitation and location along the Bronze Age coast in Norrland, one needed to make a careful spatial analysis with consideration to both spatial, morphological and ecological factors and level relationships. Such a one should, however, run too far in this context. In the Medelpad material, there is no morphological support for such a division (compare table 4.2.2), since both types, constructional details and the features' size and distribution picture have a very even spread. The dominance of small groups and single, scattered features in the distribution picture (compare 4.2.2) makes a division of social units difficult. The homogeneous distribution picture, which in comparison to the graves in the Iron Age settled areas do not either have any relation to the historical period's administrative division, have evidently its reason in the fact that the ecologically uniting band - the sea - of natural reasons gives a basis for a continual spatial distribution.

If one, in spite of this, attempts a spatial, topographically dependent divison of Medelpad's coastal environment in the same way as in Ångermanland, one may rather arbitrarily imagine three units: two relatively well united on the coastal plain in Njurunda respectively Tynderö parishes and a sparse and more spread on the steep coast at the inner part of the Sundsvall Bay within the N part of Njurunda, Alnö, Sundsvall and Skön parishes (compare Selinge 1973: 221 and JBV: 397). Each supported unit should, in that case, consist of 75-100 grave constructions, that is to say, be comparable with the larger in Ångermanland. In these figures are included, however - fairly evenly distributed - also the 30 % of the coastal environment's graves, which are located at the lower Iron Age's coast (JBV: 392). If the prerequisites which Baudou builds his analysis upon - that is to say, that a social group during several centuries of the Bronze Age lived within a rather limited part of the coast and all-round exploited this and a non-definable area within - are correct, then at the coast of Medelpad three such units should have existed, each possibly of an extended family's size.

A such, comparably permanent cultural form seems hardly, however, to be the principally normal case for a society, which is mainly accepted to be of a mobile hunting character. Several of the generally formulated principles for a hunting society seems to presuppose considerably greater mobility,

variability and flexibility both in the relationship to the environment and to the surrounding social groups (Lee & DeVore 1968: 11 f). This concerns, for example, the principles of redistribution of population between groups for an effective nutritional supply, the principle of flexible organization in order to meet variations in the available nutrition and the principle that no group ought to be too firmly tied to one defined area. It may also be discussed whether "extended family" is the most adequate term of the group, which was required in order to maintain "the local group equilibrium system" (Birdsell 1968: 234 f, compare Baudou 1977: 135). The above normal group size for the inland hunting culture, used because of anthropological reasons, ought to be larger and differently organized than an extended family. This concept might, moreover, more appropriately belong to an agrarian tradition. The group function may also be discussed in relationship to other contemporary groups, not only along the coast but also in the inland. One has brought forward reasons for a difference in that respect, appearing during the Bronze Age as a marked deviation from the earlier conditions (Baudou 1974: 42, 1977: 129). The burial tradition, now appearing at the coast, is considered to stand in relation to a segregation between the coast and the inland. This might have its reason in changes that emerge in this period both in the coastal population's ethnical composition and in its subsistence system. At the same time other changes are seen - above all within stone technology - mainly appearing in the inland. These problems are, at present, difficult to solve but deserve a discussion.

5.2.2 Coast and inland

Independent of the social unit's chorology, the graves in the coastal environment have successively been left at places attractive for residence - often at a strait and on islets and points of the type exemplified in Fig. 16 - of a population which has been mobile within a larger or smaller part of the coast. The greater concentrations may mark places which one more regularly returned to - possibly of religious or other ideal reasons but more probably because of the suitability in the economical/ecological respect. Successive grave levels of the same type as at Omsberget (Fig. 16) ought to be a result of these locations' exploitation through time. They are though never cemeteries in the same definition as in the Iron Age settled areas (Baudou 1968: 128). The graves' function as a social and memorial marking was probably expected by the grave builders to be best satisfied in a location, where one could take it for granted that people should also be occupying land even in the future - that is to say, in terrain locations of the same type as where they themselves were prospering. In this contemporary function as social signals

lie the basis of the graves' present-day value as scientific indications of areas of occupation - that is to say, as informers of cultural-ecological information on a macro-level (compare Moberg 1969: 197 f). For the interpretation of the coastal environment is, therefore - as for other grave environments - the question important whether this information was made consciusly selective, for example through locating the graves inly in chosen parts of the annual territory, through reserving certain grave types for chosen locations or through defining the grave location by irrational, or ideal factors. The above (4.2.2) has made probable that the graves in principle represent the social group's cultural-ecologically conditioned area, and the theory that they may have a sub-function as a territorial marking for this area has been indicated (Baudou 1968: 126). The question is, however, still open as to whether they are marking the whole territory or have an equivalent representation within it.

The above sketched understanding of a locally relatively fixed, social group division of the coastal culture's system takes it obviously for granted that such a representation exists, even if the question of the habitation areas' detailed location is left open. As an alternative to this delimited group division, which invites several difficulties in interpretation, one may, however, imagine a more flexible one which spatially may correspond to a greater mobility in two directions: partly to a larger area along the coast and partly to a larger area farther inland. In both cases, it is assumed that the temporary residences, according to the above (4.2.3) chosen anaology has lain in the same part of the terrain as the graves.

The rather arbitrary delimitations between social units with guidance of the grave groups' scattered locations may, in the former case, alternatively be replaced by a model, where one or several larger and more flexible composed units move over considerably larger areas along the coast. The selection of certain suitable memorial locations give, in this case, the same effect in the distribution picture. Different parts of the coast could in such a case have been used during different seasons, divided by longer or shorter movements along the coastal stretch. In principle, such a movement may have taken place along the whole of the Norrlandic coast. It should, in a satisfactory way, explain the graves' generally very continuous distribution along the coastal stretch and their homogeneous morphology. Further, this hypothesis might explain the graves' specific location in the archipelago as dependent of an ethnic group without appreciable connections towards the interior. It should also, because of the assumed mobility, offer an unsought explanation of the connections with more southerly Bronze Age environments that grave

traditions and burial customs invite. As an imaginable but possibly anacronistic analogy, one may be reminded of the extensive seasonal journies for fishing and possibly seal hunting which, in any case, during and after the Middle Ages were conducted by the bourgeois in the small towns of the Mälar Valley and S Norrland up along the coast, in any case including the county of Västernorrland (Cederlund 1974: 29).

The most serious objection agains this hypothesis seems to lie in the fact that nearly all of the grave locations appear to lie in the same human-ecological environment. They invite, consequently, the same seasonal conditions for subsistence without making possible the variations which of climatical reasons are probable. Independent of which season the graves represent, they may hardly, for that reason, correspond to equivalent occupations during all the parts of the year. A seasonal dwelling S of the Norrlandic coast - for example during the winter in the Uppland areas with heaps of fire-cracked stone - in a way, vaguely reminiscent of the Middle Ages, is of geographical reasons not especially probable but a cultural form of so obvious mobility might not be completely unthinkable. It should, in such a case, be represented by graves of the same type both in winter and summer residences.

The other alternative, according to the above, should imply that social groups with the same mobility instead have spent other seasons on dwelling sites in the interior. Above (5.1.2) I have pointed out as probable that the inland hunting groups, with a home base territory in the forest lands above the highest coastline, during the Stone Age seasonally have been in movement down towards or to the coast where, however, unfortunately no dwelling site locations are known in detail. The frequency of stray finds indicates a homogeneous distribution towards the interior of objects with both a southerly and a norhterly character during the Neolithic period (4.1.3) and the same may be said to hold true for the few finds from the Bronze Age. In N Ångermanland simple shaft hole axes from the late Neolithic and/or Bronze Age have a more coastal distribution than the other stray finds (Tennander 1972: 45 f, Baudou 1974: 38 f, 1977: 129). As is clear from above, this is not the situation within the Ljungan Valley. The very few coastal dwelling sites that in Norrland are known from the Bronze Age - for example at Edånger in Vibyggerå parish (Baudou 1973: 162 f, 1977: 48) and Fahlmark in Västerbotten (Christiansson 1974: 32 ff) - may be the result of such seasonal wanderings from the inland, but they lie too far in from the cairn locations for the above mentioned analogy with Uppland to be applicable in detail. A new stone technology for this period of supposedly easterly origins is found foremost in the inland (compare 6.2.3 below) but it is also found at the coast and a

southerly cultural relationship for this is, moreover, not either excluded (Baudou 1974: 39).

This hypothesis should explain the relationships between the coast and the inland that the find material indicates. It supports, also, the continuity between the Stone Age and Bronze Age in the area's exploitation, which a priori may be seen as probable under the condition that the coastal culture's ecologically and chorologically established hunting character is correctly interpreted. Such a continuity has been proposed also for other areas with similar prerequisites (Meinander 1946: 86). Against this can be brought forward that graves of a coastal character, with the assumption of the coastal population's seasonal migrations, ought to exist also in the inland (compare Baudou 1977: 135), since people died even during these seasons. Logically seen, the absence of these graves means a limitation in the inland within the ideal cultural category, while the above mentioned completely coastal bound variety presupposes a limitation within the economic/ecological category. In both cases, however, there exists an actual possibility that the construction of graves in general took place during the season, when it was most suitable of climatical purposes - that is to say, during the summer half of the year. One might then according to both varieties, have occupied the same coastal environment. Even in this case exist, in addition, possibilities for disposals of the dead, non-observable for the archaeologists (compare 5.1.3 above). They might, among others, have been of a temporary nature during the inland season. It must, however, be conceded that this for the part of the coastal/inland variety is irrational as explanation for the graves' clear-cut restraint to the coast. An ideal factor in the graves' location is with this variety, therefore, not excluded. This may, in such a case, have a connection with the burial tradition's clear area of contact from the S towards the N along the coast.

One may also quest how far inland a mainly coastally oriented population may have moved, since this has importance for judgement to the question of one or two cultures during the Bronze Age. A later and possibly not completely relevant analogy offers the distance from the coastal settlements to the N Norrlandic farmers' so-called "fishing marshes" (that is to say, lakes) in the inland. Steckzén has in material from the 1500's from the county of Norrbotten - where he interprets the cultural pattern as originally completely Lappish - found that the fishing area had a width towards the inland of 70-80 km (1964: 214 f and maps p. 240). A pure hunting culture may, however, probably have had a considerably greater mobility since no location here has had the same degree of permanent settlement as the farmers'. The imaginable

migrations which are exemplified in Fig. 22 are, therefore, possible also during the Bronze Age.

An older theory on a more or less professional "trading culture" with the cairn builders at the coast as carriers of the southerly relationships and with conscious exploitation of the inland's more primitive hunting culture (Hallström 1949: 42 f and 57) appear quite improbable, since all imaginable culture varieties surely completely have been supported by their own environment's immediate resources. A pronounced trading culture would, namely, prerequire also surplus and a certain food trade, which in turn might imply a principal "approach to urbanization" (Moberg 1962: 317). Such an approach may be considered quite improbable for this time and this place and other characteristics of that are completely absent. The contact area between the supposed trading culture at the coast and the inland's hunting culture ought then surely not to have lain only in the extreme coastline.

A definite standpoint to the question of whether the Bronze Age's cultural complexes in the coastland and the inland are two seasonal varieties of the same cultural system or if they make up two more independent systems is, in my opinion, not possible in today's research situation. In the former case, then no own coastal system would exist as an independent cultural form, but these archaeological sources then represent only a seasonal variation to the hunting and gathering system. The difficulties are completely dependent upon differences in the two system's archaeological sources with ideal remains in the coastal environment and predominantly functional in the inland. The continuity with the Stone Age and the seasonal/ecological interpretational difficulties for the completely coastal-bound variation means that one, in spite of everything, is more inclined to believe in a cultural form with mobility between the coast and the inland and with the memorial/religious factor in main bound to summer occupation at the sea shore.

It is not impossible that the relatively few graves in the lake environment may be able to give a contribution to the solution of the problem. They appear, namely, in a similar way in their relationship to the cultural ecological factors in the inland environment as the graves in the coastal hunting environment to corresponding factors. Both the coast's and the inland's grave locations may, as above has been indicated, have a double function as memorial and eventual cultic places and as social or economic territorial marking for a definite group. A chronological contact is also fully imaginable, since the lower level maximum in the coastal environment is generally contemporary with the graves in the inland environment during

the early Iron Age (Selinge 1973: 222, Ambrosiani unprinted). The coastal graves during the Iron Age are also dominated quite as the inland graves by earth-free stone settings, even if certain deviations in details exist. If such a connection with the coastal land may be seen as a contributing explanation to the burial tradition with built monuments in the inland, then the relationship between the coast and the inland, which principally is based upon a pure hunting economy, is fully imaginable even during the Early Iron Age. In such a hypothetical context the relationship to the agrarian system takes on a special historical interest.

5.3 AGRARIAN SYSTEM

As in the earlier chapter references, relevant in this context, shall here be left to the sections in JBV. In the last chapter of this work, however, certain indications have been given that investigations even on other than archaeological source material could be of interest for the study of the economical, social and administrative organization in the Iron Age farming society (JBV: 403 ff). In this context to make thorough such ones should be carrying things too far. In order to throw light on the contrasts and similarities with the hunting society shall, however, a cartographic model of the settlement units within one of the Iron Age settled areas be presented. A preliminary and brief comparison between the ancient monuments',the place names' and the judicial sources' picture of the settlement development during the Iron Age and the Middle Ages shall also be made in order to summarily throw light upon the lines of relationships forwards in time and the question of an administrative organization in the Iron Age society.

5.3.1 References

Social aspects are treated in JBV foremost in the sections 5 and 6. In 5.1 the question of the settlement unit's organization is considered, in 5.2 several indications of its planning are given and in 5.3 the population question within settlement units and settled areas has been discussed. In 6.1 the main ways of livelihood are treated and in 6.2 the different types of maintenance, which caused a certain social differentiation and the finds which accordingly may be interpreted as deposits of wealth. A summary of the corresponding parts are included in part 1 of this work.

5.3.2 Spatial organization of Iron Age basal units

In the sections 5.1.2 and 5.1.3 in JBV, I have attempted to analyse a couple of limited areas within the settled areas of Ådalen and Skön-Alnö with respect to graves and settlement units. Detailed analyses give no immediate clear nor easily interpreted results. As probable appear however, among others,

that the units, known from historical sources, have direct continuity back to the Iron Age, although temporary variations may appear both in population and settlement during the Iron Age as well as the Middle Ages (JBV: 325 ff). The continuity to historical times imply, among others, that the conditions of the historical periods in a summary context may be used as a model for the Iron Age's human ecological social system. The Norrlandic Iron Age settled areas may, in this case, be seen as an example of Binford's first analogy criterium, that is to say, that "relevance can be established by demonstrating, or accepting as demonstrated, that there is a historical continuity between the archaeologically observed unit and the ethnographically cited society or social unit" (1972: 36). One main result of the investigation in JBV was that settlement with greatest probability was organized in single farms, whose population size is somewhat uncertain since only a selection of the population was buried (JBV: 348). This only partially known population group must, however, have constituted the functional social basic unit and its size may, of analogous and empirical reasons, on the average hardly have varied outside a frame of one or two tens. The graves may, in round numbers, represent approximately a quarter of these inhabitants. The historical period's farm or hamlet with ancient monuments is, henceforth, seen as a spatial model of the corresponding prehistorical unit. As the historical units consist of very few farms (holdings), they are consequently termed hamlets.

Clarke (1972 B) has, with the point of departure in a large English Iron Age habitation, constructed a detailed model for a spatial analysis of an Iron Age society. The analysis of the central habitation itself may be ignored, since excavated such ones are lacking in Medelpad. The English example corresponds - although considerably larger (Clarke 1972 B: 834) - in principle to a freely organized lot - that is to say, the central built up area of the unit (Sw. *tomt*) - as that of the Iron Age farm in Tuna (JBV: 335). The nearest surrounding, intensively exploited terrain is suggested as being organized partially in an "infield area" with approximately 0.8 km radius and partially an "outfield area" with approximately 2.4 km radius (Clarke 1972 B: 840 f). The former may, in principle, be considered to correspond to the infield area (Sw. *inägor*), which in a Scandinavian Iron Age farm probably generally consisted of cultivated fields. To this may also be added the central inner parts (Sw. *inmark*), that is to say lot, cattle paths and other impediments and in Medelpad possibly also pasture. Judging from the small cultivated areas from the 1500's (JBV:324) these central parts of the unit in Medelpad have - excluding pasture lands - hardly been larger

than at most approximately 10 hectares - that is to say, approximately one twentieth of that suggested in Clarke's model. The extension of the surrounding outfield area (Sw. *utmark*) is unknown in Medelpad as in Iron Age farms in most other areas, which is why it shall be discussed in the model below. The distribution into infields (*inägor* and *inmark*) on one side and outfields (*utmark*) on the other side is, however, a well-known phenomenon in Iron Age farms in general (for example Lindqvist 1968: 39 ff, Myhre 1972: 14 ff, Rønneseth 1974: 36 ff), but as was pointed out in JBV, the borderlines between these kinds of land use is impossible to now observe in the field in Medelpad.

As an example of the spatial organization of a settled area (Sw. *bygd*, definition JBV: 191) in settlement units, the Tuna-Attmar settled area is chosen here, as it is the largest in the Ljungan Valley both concerning the number of historical settlement units and considering ancient monuments (Fig. 23). Because of the settled valley's special topographical prerequisites, I have chosen not to construct the model mathematically or geometrically, which is the rule in unbiassed models, but to instead, according to the chosen analogy, proceed from the hamlet boundaries from historical times. These are taken from the present Economic Map, since these limitations have shown to have had a long stability (Hyenstrand 1974: 35 and 43) and an exact agreement is not here sought. I ignore empirically smaller modern partitions and irregularities and include all primary units with their own place names and unit functions in the register of real estate - that is to say, farms or hamlets which may be judged to have been colonized as independent, primary units of agrarian nature. These are checked against the two oldest taxation books from the 1500's (Nordlander 1896: 123 ff, Hellbom 1972: 206 f), where they ought to be found in at least one. As place for localization within each unit the judged original hamlet farmstead (*tomt*) was chosen. In two cases, two locations were laid out within the same limits, namely for Vattjom and Allsta, which have considerably higher number of ancient monuments than other units and which during the Iron Age may have consisted of two farms each (JBV: 348 respectively 206 and 209). Each marking in the model after this correction is presupposed to correspond to one Iron Age farm. The symbol for this is geometrically scaled according to the occurrence of ancient monuments. In the nature of the scale lies that it generally ought to be a rough indication of the unit's time of settlement (JBV: 248). With point of origin in these monument numbers an internal colonization model might be constructed with the units most dense in ancient monuments as mother units and the other as filial generations. Such models

for later Norrlandic colonization has been suggested by Bylund (1960). Especially Bylund's model (1960: 228) with evaluation of the units from a base line - here appropriately the river/lake - seem usable. With respect to the faulty control possibilities and possible wrong sources in the Iron Age settlement history (JBV: 246 ff) I decline, however, from a speculative extension in this direction.

Moreover, it had been desirable with a marking of the exact extension of the infield area. This is unavailable for the Iron Age but the field area of the oldest surveyor's maps may have large similarities with the fields from the Middle Ages. The extension cannot, on the other hand, be found on the present-day map material because of the extensive modern cultivation, which now, in practice, to a great degree coincides with the valley's cultivable surfaces in general. Therefore, in an empirical stereotyped way, the central parts of the present-day cultivated land has been indicated by each of the farms. This is surely greater than both the Iron Age's and the Middle Age's infield areas, but may, at any rate, give a principle idea about its inconsiderable size in relation to the outfields. The Iron Age graves are generally located within or in immediate connection to these surfaces. In some exceptions, they may, however, lie at a greater distance from the farmstead - for example the large cemetery at Vinoret within Vivsta hamlet which lies on the opposite side of the lake (Selinge 1969: 247 f). In that case, as well as at the S Allsta unit and in a couple of more cases, it is also possible that the graves' more separated location may have a relation to the evidenced irregularities in the settlement historical development between the earlier and later Iron Ages (JBV: 362). Three locations with 1-2 graves each is not included as they are separately located in the outfields in S Attmar and lack contact with respective hamlet locations. The S part of Attmar and the W part of Tuna are not included as they consist of outfields or units, which with exception for two cases - the hamlets Hassel and Sörböle - were colonized later than the Middle Ages.

Detailed geological maps are, at present, not available, but purely empirically and judging from the map picture one may conclude that the colonization has been tied to the most favourable cultivation exposures, where farmsteads and infields were located. Expressed in geographical terms, which are used on Norrlandic conditions during historic times, the settlement in the first place is a lake settlement but with tendencies in places to slope locations (Sw. *lidlägen*), however, probably without much regard to the local climatical factors which in more exposed positions lie in these terms (Rudberg 1957: 68 ff). During the Iron Age - and especially during its earlier part - has

around this settled area run the "line of demarcation" between the settled and unsettled land (Rudberg 1957: 11), which subsequently through historical times continually by the successive colonization has been pushed inland and towards higher levels. What today, in comparison with later colonized areas, can appear as a relatively favourable cultivation area might very well during the early Iron Age have been experienced as a pioneer area, where it might not be taken for granted that a sedentary way of life with agriculture and animal husbandry as a given basic way of livelihood might prove to be more advantageous than the earlier mobile culture with hunting and gathering as a base.

The net of unit delimitations in the model is secondarily developed in relationship to colonization and it may, in principle, be considered conditioned by the topographical demands of this. The delimitation net may, in a model, be used as frames for "catchment areas" or "home base territories". These form in valley landscapes usually a band-formed structure (Hyenstrand 1974: 35). The units' judicial lateral expansion along the infield area is, then, fairly given and ought, with topographical adjustments in large, to lie on the median between the farmsteads. But how far up through the out-fields did the farm's ownership extend during the earliest period? A portion of the outer delimitation net is surely later - but how large a part and to what an extent later? Were there areas which were open for mutual exploitaion for the whole or parts of the settled area - that is to say, a common "exploitation territory" (Clarke 1972 B: 851)? And how were the relationships of property concerning the infield area organized?

At least the first and last of these questions may be given probable answers from the chosen analogy. For the Medieval society, these relationships were regulated in the Law of Hälsingland, valid for the whole of Norrland. In this regulated society, besides the infield areas, hamlet forests and common forests are special judicial areas of land use (Wessén 1968: 133, Jonsson 1971: 59 ff). The infield area lay then under private ownership, the hamlet forest with an undefined topographic outermost border was at the disposal of the hamlet community, and the provincial commons (Sw. *landsallmänningen*) farther out were completely at the disposal of free colonization and surely also for other uses - for example hunting. Private judicial right to the infields ought to have been applied unrestrictedly also during the Iron Age, to which there are parallels in, among other places, Norway (Rønneseth 1974: 41). The commons free disposal might have governed the use of uncolonized lands in general. The disposal of the hamlet forest is related to the difficultly answered question of the genesis of the village institution.

To enter into its fiscal, measuremental and settlement regulative functions should run too far in this context (Jonsson 1971: 32 ff). It may hardly be discussed, either, with point of origin in the Norrlandic situation, since decisions in the Hälsingland Law may not be seen as isolated from the other provincial laws - foremost the Law of Uppland. The standard holding may have been the primary unit (Jonsson 1971: 26 f), and the village concept does not, in principle, have anything to do with the number of holders within a named unit. The Hälsingland Law prerequires thus that there are villages in which no "more have a part in than one" (Wessén 1968: 131). "Hamlets" with one or very few holders are also usual both in Medelpad and in other parts of Sweden (compare Jonsson 1971: 188) while in Norway "farms" (that is to say, "historical farms" or "name farms") often have several holders (for example Rønneseth 1974: 94). The two concepts are, therefore, practically comparable.

Because of the later development, I hold it probable that not even the nearest forest during the Iron Age was privately disposed of unrestrictedly by the farmers, even if they owned and used single farms which first later were developed into hamlets in a settlement-historical meaning. It seems probable that the exploitation of the outfields grew out of and were regulated by the practical need,and this was flexible to its outer delimitation later on in time (Jonsson 1971: 60 f). In territorial archaeology the importance of distance for the degree of land use is put forward but also that "behind the factor of distance lies a more basic one, that of time/energy" (Jarman 1972: 710). The Hälsingland Law's ancient regulation of the so-called *stöttingsmil* - that is to say, that a colonizer in the commons was allowed to dispose of forest lands up to a distance, which allowed him to, on the shortest day of the year, travel out and back and cut a load of stakes (Jonsson 1971: 61) - makes in itself an illustrative example of that such catchment areas in literal meaning also have obtained a practical/judicial function. The regulation gives then a support for that the distance model used in spatial archaeology according to the time/energy principle is applicable. According to Jonsson (op.cit.) this regulation may in a 17th century statute be converted into a distance of approximately 7-8 km.

Against the background of this Medieval analogy, I am inclined to formulate the following model for the social/judicial regulation of land use within the Iron Age settled areas. One area comparable to the latter infields and farmsteads was ruled by judicial ownership of the farm's holders - judging from the conclusions, drawn in JBV, a propertied family or clan. One area outside of this, which in principle corresponded to the later hamlet forests, was ruled with flexible judicial disposition as long as it was practically

possible and necessary - for example for grazing, hay-making, and household exploitation of different necessities, etc. It was delimited only after need and then mainly laterally. A greater area, lying between and outside, which in principle is equivalent with the latter provincial commons - or for that part, also with the later Norrlandic crown forest areas, left after the forest land-surveying duties (Sw. *avvittring*, compare Rudberg 1957: 122 f) - was available for general use and for new colonization. During the Iron Age, this held true not only for forest-covered higher moraine areas but even uncolonized parts of the valleys. Whether some organization for the use of such areas existed is dependent upon the administrative relationships in the Iron Age society as a whole, which shall be discussed below. Human-ecologically speaking, they probably functioned on a wide level - that is to say, they could freely be exploited by people from different settled areas. In this use may also have been included the construction and use of hunting facilities such as trapping pits, traps, deadfalls, snares, etc. It must also be considered open but fully possible if there still in the Iron Age existed possibilities for temporary passages of smaller groups of people, who then still lived on a hunting level, within the spacious "corridors" between the settled areas which these lands then still formed. The possibility of a remaining hunting population in marginal inland locations is namely fully imaginable, and a mobility of earlier evidenced type might, therefore, also have to be considered (compare Hagen 1970: 153).

This model for the exploitation of the outfields is in principle related to that which was used for the establishment of catchment areas within the hunting culture's system in Klövsjö (5.1.1 above). Both are an example of an extensive land exploitation for subsistence requirements or completion to such without production. The exploitation of the single hamlet's outfields - for example for grazing, hay-making and lumbering - takes in intensity a position between the infields and purely extensive commons. The relatively dense distribution in plane of farmsteads and infields over the exploitation territory and the constancy in their exploitation makes, on the other hand, a strong contrast to the hunting culture's dispersive and mobile picture. The number of contemporary units in a surface of the Iron Age model's size should, according to the hunting model, reach at most one twentieth of that here evidenced. From a regional point of view, it is also of great importance that the few sources in the coastal environment definitely speak for that this environment is related to the hunting culture's model and greatly deviating from the Iron Age culture's. The establishment of the Iron Age model for land use must, therefore, mean the greatest fundamental new

orientation in the Ljungan Valley's - and probably in the whole of Norrland's - prehistory and history. The extensive exploitation of outfields - and especially of the provincial commons - in the Iron Age and historic times may, from an economic/historic point of view be seen as a directly delaying remain of the conditions in the hunting culture's human ecological system.

A comparison between the two models for the use of the environment, from an effect and energy point of view, would, lastly, be of great interest since here, principally seen, the deepest differences in the human ecological systems are to be studied (see for example Sherratt 1972). Such a one lies, however, outside of the goals of this investigation. Probably the result should, however, not only be that the extraction from the environment is many times greater in the agricultural system, but also that the input of work here is considerably greater (compare for example Lee 1968: 36 f, Sahlins 1968 and Sherratt 1972: 491 ff). The systems may themselves reach an equilibrium, which is an expression for an optimal land use but on highly differing levels (Sherratt 1972: 482 f). The advantage of the system shift then lies in the marked increase in possibilities of support - that is to say, the environment may support many more people. It does, on the other hand, not mean that the single men or groups of people have managed "better" in any objective measurable definition (compare Binford 1972: 436). It is, therefore, neither given that the system shift was the result of a choosing situation with weighing of pros and cons - it may, quite fairly, have been depending upon contributing circumstances over which one did not have control. The question is if a "cultural-processual model" may explain the two systems' possible relationship or clarify if they are completely ununitable. May the long-term adaptive changes which occur in a human-ecological system in balance bring about that this, at a critical level, gets a trajectory which leads to a completely new system, or is the new system in its totality a complete innovation in the area? Before this question is taken up, first the question of an administrative organization on a higher level shall be discussed.

5.3.3 Spatial organization of Iron Age higher units

The exploitation of the provincial commons, the distribution of settlement units within the settled areas and the settled areas topographical delimitation are examples of the factors, which wake the question of whether an over-all organization of administrative or judicial type existed in the Iron Age farming society. The knowledge of one such in the Medieval sources in the form of parishes and *skeppslag* (originally meaning equipment district for a ship in a naval warfare organization, *ledung*, here known as higher spatial unit in general, sg. and pl.) acutalize also the question of this

organization's age or of its prerequisites in the older Iron Age society. In JBV (189 ff) it has been declared that the Iron Age settlement areas have a purely spatial agreement with the Middle Age parishes and that the cultural landscape's constitution indicates a continuity between the Iron Age and the Middle Ages (JBV: 326). It is, therefore, a given point of origin to attach a test of the question of the administrative organization to the Medieval parish divisions. Even such a one may, however, be adapted to more fundamental and unconditionally constructed models.

Clarke suggests, then, in addition to his above mentioned division into infield and outfield areas, for the Iron Age society's higher social levels a division into three "boxes" (1972 B: 841 ff) with approximately 15, 30, and 120 km radius named "exploitation territory", "system catchment area" and "tribal region" (1972 B: 851). The two former of these might, from a purely territorial point of view, be compared with the single settled areas (*bygder*) respectively the whole agrarian cultural system in Medelpad or the Ljungan Valley. The largest unit should, in that case, correspond to at least the whole river basin, that is to say, include possible relationships outside of the agrarian system's frame to the coast and the inland and possibly also to the bordering river basins. If this larger unit may be interpreted as an ethnic tribal unit, is, however, not given. The activity from the single settlement unit within these larger units stands in a reverse proportion with their distance and size - according to Clarke suitably after a logarithmic scale (1972 B: 852). It is, however, obvious that for example topographical relationships and economical factors - among others the degree of cooperation between different units - has great influence on the model's function. Communication between different levels within the model may also change at different times and, among others, may be expected to increase if and when certain units reach a certain stage of specialization (JBV: 371 f). Generally seen it increases then with decreasing degree of self-support. Communication ought during all conditions to have been most dense within the separate settled areas - or "exploitation territories" - which is why an attachment to the parishes, which often are corresponding to the settled areas, even from this viewpoint is natural.

The development of the Middle Ages' church parishes from an organization, established during the Iron Age, has for a long time been discussed especially with background material from the Mälar Valley (Hyenstrand 1974: 44 ff with op.cit.). Contrary to earlier calculations, which in main are based upon fiscal source material, Hyenstrand has proposed that even simple numerical count of settlement units within the Medieval parishes may indicate

the probability of a model with "twelfths", which in the central settled areas has been formed already during the late Iron Age, and, thereafter, has become pattern-creating for the parish divisions. These twelfths might, in turn, with clear regularity form a base for the higher division in hundreds (Hyenstrand 1974: 82 ff). As a basic source for the settlement unit cemeteries of the late Iron Age type have been used, which define "primary units" (Hyenstrand 1974: 36 and 43). As completing or alternative counting bases, however, "primary name units" were also used - that is to say, settlement units without such ancient monuments but with "ancient names" (Hyenstrand 1974: 49). These names were not exactly defined, but the intent is obvious that this group shall include Iron Age units with presumptive ancient monuments, removed through cultivation. The occurrence within this group of units,which have appeared firstly through Medieval colonization is, however, not excluded. This numerical model has a simplicity which makes it attractive as an historical explanation.

With consideration to the assumed possibility (JBV: 414 ff) of colonization from the S along the Norrlandic coast an investigation of the prerequisites for an administrative division of the Mälar Valley type is of historical interest also in Västernorrland and, in this context, especially in Medelpad. Even observed agreements in the land measures (*jordetal*) for the land taxation (Jonsson 1971: 31) like, naturally, the generaliy historical early Middle Age picture constitute such a comparison as interesting. With application of Hyenstrand's model all units with ancient monuments shall here be considered as primary units, which may be defined fiscally and settlement historically through place names and functions in the real estate register. Even units with known removed ancient monuments are included. These units represent, then, settlement and colonization picture at the introduction of Christianity. As a second group units without ancient monuments are here included which are shown as fiscal units in the 16th century's two oldest fiscal sources, that is to say the aiding tax list from 1535 (Hellbom 1972: 197 ff) and the tax book from 1543 (Nordlander 1896: 123 ff). In the latter group may, then, both Iron Age units without now known ancient monuments and units which were colonized first during the Middle Ages be included. It may, however, be no doubt for archaeological, topographical and place name reasons that the larger majority of these units has appeared first during the Middle Ages. Through this may also a general measurement of colonization during the centuries of the Middle Ages be obtained, counted in settlement units. Any consideration to the units' fiscal evaluation in these sources has, on the other hand, not been taken. As expressed in JBV (348) the Iron

Age settlement units in most cases consisted of single farms, and the hamlets, evidenced in the tax rolls, have as a rule also very few holdings, the numbers of which may, however, be temporarily fluctuating (JBV: 323). Taxation in Medelpad was according to the oldest sources in literal meaning a *mantal* tax (Hellbom 1972: 292) - that is to say, a tax on the number of farmers or standard holdings, the term is later on a land measure - which coincide with the Hälsingland Law's directions on duties according to the number of farmers (Wessén 1968: 103 f). From and including the 1500's the tax was imposed according to land measure in *mål* arable land (Hellbom op.cit., Jonsson 1971: 174 ff). Even for these reasons, therefore, a simple numerical count - that is to say, principally in a fiscal respect of standard holdings (Jonsson 1971: 26 f) - in this province is considerably more just for the Iron Age situation than a count, which is based upon fiscal measurements from the 16th century.

The count of settlement units has been compiled in the diagram Fig. 24. Each parish is reviewed there in a column and the parishes are compiled in groups to the *skeppslag* (compare above), reconstructed by Hellbom (1972: 9 and 273 f) according to Medieval diplomas (compare Jonsson 1971: 194 with op.cit.). An understanding that the parishes built upon or coincided with the *skeppslag* (Wessén 1968: 136 f) may obivously not be correct. The three *skeppslag* in the Ljungan Valley - in the way this is defined in this work - are taken first but for the sake of completeness, thereafter, also the province's remaining *skeppslag* are reviewed. In these are included even the parishes Sättna and Holm in the Ljungan Valley. In the scale a presumptive twelfth and half-twelfth division is included in order to make simple comparisons possible. The lower marking for each parish concerns units with ancient monuments and the upper, in addition to these, further settlement units, taxable during the first half of the 1500's. The more evenly shadowed part clarifies, then in general, visually the Medieval colonization's extent. Since the parishes in Medelpad, for geographical reasons, may be suspected to stand in dependent relation to the province's topography,as a control group the parishes in Ådalen in Angermanland also are included with the same account. These constitute namely a topographically connected settled area, where the parish boundaries seem to offer greater conditions of being purely administratively prerequired (JBV: 410). These are reviewed for the later time period with those units which according to Bucht's evidence (1965) were settled before 1550.

May these compilations of the number of settlement units be interpreted in such a way that an organizational model, according to the twelfth principle, was used in Medelpad? One may, of course, not expect that the number of units neither at the end of the Iron Age nor the Middle Ages might exactly correspond

to such a division. One must, rather, take into account that single units, which originally have had ancient monuments, may have lost these in a now uncontrollable way. It is also improbable that the introduction of such a model might exactly coincide with the heathen burial tradition's extinction. A presumptive twelfth organization ought, however, to be expressed in the fact that many parishes' number of units at a certain point in time ought to lie near multiples of 6. The difficulty lies in establishing a common point in time for the introduction of such an organization. If it might lie in, for example, the early Middle Ages, a certain multiple ought to lie within the lower part of the column for Medieval colonization. It may, however, have varying distance to the Iron Age column, because of the local differences in the rate and extent of colonization. Such a point in time is, therefore, nearly impossible to extract for parishes with principally Medieval colonization as in the upper Ljungan Valley (Torp's *skeppslag*) and within Ljustorp's *skeppslag*, since the units in these areas, as a rule, are known first in the 16th century sources. Such a model may be imaginable for the distinct Iron Age parishes of Tuna, Selånger, Skön, Alnö and Timrå, which at a common point in time might have existed as double twelfths, and for Styrnäs, Multrå and Sollefteå in Ådalen - possibly also Stöde - which might have existed as single twelfths. One and a half twelfths might, in the same way, be imagined to be a model for Attmar, Torsåker and Boteå, while the playing room for other parishes - inclusive the largest distinct Iron Age parish Njurunda - is so large that pure guesses are completely meaningless. In Ådalen the distinct Iron Age parishes Överlännäs and Sånga probably are completely impossible to fit into a twelfth model. The parishes of Ådalen might, moreover, be still more irregular if the extension of Torsåker parish, established according to 16th century's sources (JBV: 190), might be original. In such a case, seven Iron Age units and three Medieval units from Överlännäs, Boteå and Sånga should instead belong to Torsåker.

A theoretical possibility of reducing the uncertainty in these judgements might be to introduce still another variable. Hyenstrand has, as mentioned above, also calculated with "ancient names" as such a one. As was briefly mentioned earlier (JBV: 405) in Västernorrland also ancient place name types occur in parishes with Iron Age settlement. To use these as datings for settlement collides, however, with at least three principle difficulties. Partly the names do not necessarily need to be contemporary with, but may also be either older - that is to say, secondary as settlement names - or younger - that is in possible cases of changed names - than the habitations with associated ancient monuments to which they are now tied (Flemström 1959:

97 and 107, Ståhl 1970: 59, Pamp 1971: 21 f). Partly the linguistic datings of names and types of names are slightly precise and build to a certain degreee upon other settlement historical facts (Flemström 1959: 98, Pamp 1971: 22 ff). Partly, and lastly, the placement of the present-day settlement names in these name types is, in certain cases, difficult - in all events for a language historical non-specialist. The place names of Medelpad are still not decidedly interpreted and published but certain preliminary interpretations exist (Nordlander 1903, Flemström 1959 with op.cit.). For Medieval evidences Hellbom (1972: 296 ff) is generally referred to.

From the viewpoint of relative chronology it is for each archaeologist, directed towards settlement history, clear and often witnessed that place name types, mainly guided by the last element, may be divided into two large main groups - those which generally appear at settlements with Iron Age cemeteries and those which generally lack such remains. In large, this division also agrees with the, from a linguistic point of view, older respectively younger name types (Ståhl 1970: 61 ff and Pamp 1971: 27 ff respectively Ståhl 1970: 83 ff and Pamp 1971: 48 ff). Within both of these groups may, in addition, uncompounded and compounded names, characterizing natural or cultural conditions, without type constructing elements appear. Within the normally older group are, in Medelpad, names on originally *-vin*, *-hem*, *-sta*, *-land*, *-tuna* and *-by(n)* represented, likewise uncompounded names, among which some cultic *Hov* and *Vi*, and compounded names of other types. Within the younger group, besides names from the last mentioned groups are also noticed names on *-säter*, *-bo*, *-bol*, and *-böle*, to which may be added certain names which probably indicate early partioned (*avgärda*) units, for example names with *-gård* (Flemström 1959: 99 ff).

I have attempted to preliminary classify all names of the units, which are registered in the diagram Fig. 24, in certain main types according to the table Fig. 25. The classification of the older names offer difficulties mainly in two respects, partly to pick out and differ names of original *-vin* and *-land*, which often are distorted and combined, and partly to differ names on original *-hem* and uncompound names in plural dative which both now often end in *-um*, *-om*, *-em*, or similar. An examination with linguistic knowledge should naturally be surer, among others, because consideration could be taken to the dialectal pronounciation and linguistic parallels. A comparison with the published material from Ångermanland (Bucht 1965) can give certain clues, especially in the last mentioned question. Of just more than 40 names of the modern-day *-um*, *-om* etc. are there approximately 30 assigned to the type of *-hem*, of which some have direct parallels in Medelpad. It is, however,

difficult to see any consistent consequence in this classification solely with consideration to the Medieval evidences. Concerning *-vin* names Flemström (1959: 99) gives certain directions. Names of these types[1] are, however, totally seen few in comparison with the large and relatively easily handled groups *-sta* names and names with nature-describing elements. As a special group "cultic and administrative names" have been listed *-tuna* names and the simple *Hov* and *Vi*. For the sake of space only summaries for the *skeppslag* is reviewed here. For the control area in Ångermanland have partly Boteå *skeppslag*, which is the only complete within the Ådalen settled area, and partly the whole of this settled area been reviewed. In the column remarks are the names shown, which are included in the group other names. Among them are the here probably heteregeneous names of *-by(n)* or simple *Byn* noted. The table is a simple "trait list" where only occurrence respectively non-occurrence of ancient monuments on the name types have been registered.

As is seen in the table, the cultic and administrative names are the only group which solely appears in units with ancient monuments. A high frequency of ancient monuments have also *-vin* names with 90 % in Medelpad and 100 % in Ångermanland, and the only *-vin* name that lacks ancient monuments is Hjältan in Torp, which is located between Torp and Stöde settled areas in an area with typical Medieval colonization. Names on *-hem* and *-land* are, on the other hand, considerably less unequivocal. The latter type may possibly be linguisticly heterogeneous (Ståhl 1970: 81 f), but the frequency 40 respectively 69 % units with ancient monuments within the *-hem* type might probably be interpreted so that this name type in Norrland may have been productive also after the end of the prehistoric period. That should be seen equally marked if one reworked the remaining more than 20 *-hem* names in Ångermanland, of which about one-third seem to lack ancient monuments. In Medelpad there is, in addition, one *-hem* name (Gryttjom in Hässjö parish, Flemström 1959: 118) which lacks evidence in the sources used here.

The more numerous and statistically more sure *-sta* names have considerably higher ancient monument frequency in Medelpad with 83 % but does not reach higher than 62 % in Ådalen. The relatively high destruction by ploughing

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1) As *-hem* names Häljum in Njurunda, Vattjom in Tuna, Solum in Sättna, Öppom and Sköljom in Ljustorp have been counted, as *-vin* names have Svala in Njurunda, Knävland in Selånger, Maland and Fillan in Skön, Röde on Alnö, Vänna and Roken in Timrå, Björkom and Edsta in Ljustorp and Hjältan in Torp been included; as *-land* names have Nyland in Njurunda, Västland in Skön, Rökland and Usland on Alnö, Brattland, Fröland and Vävland in Timrå, Usland in Stöde and Vissland in Torp been counted.

away ancient monuments here may have influenced this number, but it is probable that settlements with *-sta* names in exceptional cases may have been colonized after the end of the prehistoric period. To this there are parallels, among others, in Jämtland where these names partially are distributed outside of the ancient monument area. The, as a group, chronologically irrelevant names with nature-describing elements seem in Medelpad to be markedly older in uncompound form with 65 % of units with ancient monuments compared with 28 % for the compound. That the numbers in Ådalen are more even with 63 respectively 68 % may solely depend upon the river valley's character of an Iron Age settled area with limited space for later colonization, and the compound names may be considerably more usual in the later colonized parts of the province. Names with *-säter* may, in exceptional cases, probably be dated to the end of the prehistoric period, which coincides with the situation in Uppland - in any case for the *-sätra* names (compare Pamp 1971: 57). To make the same conclusions for the fiscally and areally usually smaller units with *-bol* and *-böle* is, however, hardly advisable, since these in practice may be comparable with names of *avgärda* or partitioned units, which may have appeared through division of earlier Iron Age farms. Names with *-by* seem within this area so flexible as one for linguistic and topographical reasons might expect.

Earlier it has been established (JBV: 248) that the density of ancient monuments generally may be seen as a function of the length of the settlement period. Taking it for granted that the originally given names of the units have not been changed, the number of ancient monuments might then be able to give a relative dating of the name types. The average number of graves per named unit with ancient monuments has, therefore, been marked. Aside from the two *-hem* hamlets, Häljum in Njurunda and Vattjom in Tuna, which are rich in ancient monuments and give the *-hem* names a non-representative average, the differences are not great. It may, however, be noticed that also the average is highest for the cultic and administrative names in Medelpad and that the *-sta* names follow closely behind. The former are, however, few and are greatly influenced by the two *Tuna* settlements in Njurunda and Tuna. The values are, except for the nature names, lower in Ångermanland - less dense in ancient monuments and mainly of a Viking Age date. Any deciding conclusions of general importance for the name types' relative dating may, therefore, not be drawn from the material. In large, the generally known division into a prehistoric and a historic group of name types are reinforced, but the transition period between these may be long, and the exceptions from the main rule seem to be considerable. This result which indicates relatively

long productivity for several earlier name types seems relatively well to agree with the corresponding investigations in the very similar Rogaland, which, however, is considerably richer from both an archaeological and a place name point of view (Møllerop 1973: 276 ff with op.cit.).

Settlement names are, therefore, hardly generally useable for adjustments in the above given view of possible social units on the level "twelfth", "parish", "settlement area" or "exploitation territory". In certain cases, it may be thought that names from the earlier group together with topographical factors may give indications on incorrectness in the grave material's source value. So may, for example, some additional *-sta* names in Torp's or Indal's *skeppslag* or in Ådalen - that is to say, in settled areas with low degree of preserved ancient monuments (JBV: 171) - have had ancient monuments. In another case, may a group of names with central location in the settled area indicate ploughing away of ancient monuments - for example the names Solum, Tösta and Brödlösa, which lie well clustered in the valley through Sättna parish, or the marked concentration of earlier name types with few or no ancient monuments in Ljustorp parish, among others, 2 *-hem* names, 2 *-vin* names and 2 *-tuna* names. In other cases, it is, however, clear how valleys with present-day central agricultural settlement between the Iron Age settled areas are dominated by younger or chronologically non-significant names - for example the Ljungan Valley between the Selånger settled area and Vattjom in Tuna or between the Stöde and Torp settled areas. These names and hamlets must be considered to be the result of Medieval colonization. For greater areas also the absence of Iron Age ancient monuments agrees well with the name types' evidence of a main colonization during the Middle Ages - for example for the inner parts of Torp's *skeppslag* in Borgsjö and Haverö parishes and for Hässjö parish in Ljustorp's *skeppslag*.

Within Jämtland's and Härjedalen's parts of Ljungan's main valley, none of the relatively few hamlet names are of early type, with the exception of Rätan which is considered to be a *-vin* name (Flemström 1972: 174 f). Those names, as a rule with nature-describing elements,agree fairly well with the ancient monument's picture of a permanent colonization first during the Middle Ages or later. In the uppermost Gimå Valley which is an expansion of the Storsjö basin's Iron Age settled area in Jämtland, there are some names of older types of farms with ancient monuments within Lockne parish (Selinge 1967: 32). There are also single examples of similar names in the upper part of the pronounced Medieval colonization area (compare the map Fig. 27 below) in S Lockne, Revsund, Bodsjö, Sundsjö, Bräcke and Hällesjö parishes (for example Selinge 1967: 34), but most names are here nature-describing (see

approximately 65 examples in Flemström 1972).

Single, arbitrary adjustments with guidance of Medelpad's name types in the diagram Fig. 24 gives hardly a better agreement with a presupposed twelfth model than the diagram already illustrates. The regularities which the diagram according to the above indicates - above all for the pronounced Iron Age parishes - may be interpreted as indications for a twelfth model. I consider, however, that such a model is not possible to evidence for Medelpad or Ådalen, and the occurrence of a such one may, therefore, be doubtful for the whole of Västernorrland. The organization of the Medieval church parishes may alternatively have had its basis in the extent of colonization and the topographical conditions of the landscape, and each closed settled area may have composed a natural and communicatively conditioned base for the parish division. Where these units have been sufficiently large, they may have been divided into a couple of parishes - for example Tuna and Attmar in the Marmen basin (compare Fig. 23). That the parishes in Ådalen throughout are always smaller than in Medelpad - counted in settlement units - may speculatively be imagined to have a relationship with the no mean wealth, which is evidenced in the area's late Viking Age treasure finds (compare JBV: 397 f with op.cit.) and which also may have been expressed in the ability to build and support a church in a fewer number of settlement units. The lack of evidence of a numerical model for a larger social organization during the Iron Age does not, on the other hand, eliminate that such a one may have existed - eventually of a more flexible and, in any case, not now perceptible model. As has been evidenced in the above, it is also improbable that it was based upon any form of fiscal evaluation. It may instead already then have had its basis in a topographically and communicatively given communion - in principle spatially corresponding with those in JBV (especially 191) verified settled areas. This unit may then directly have taken over the new, Medieval tasks. The occurrence of and tasks for a similar organization in pre-Christian times lie, however, outside the archaeologically, place name historically and ancient topographically evident.

The higher division into *skeppslag* is considered to be old in Medelpad and it might reach back to the *ledung* organization's principles, eventually with a fourth division as a base (Jonsson 1971: 23 ff with op.cit. and 200 ff). As functioning units, the *skeppslag* are however historically known only in the function of district judicial units (*tingslag*) (Hellbom 1972: 273 f). The extent in number of settlement units of the late Medieval *tingslag* is seen below in the diagram Fig. 24, partly at the transition from the Iron Age to the Middle Ages and partly at the middle of the 16th century. An earlier

boundary between Ljustorp and Timrå parishes entails that 4 units at the later occasion ought to be moved from Skön's to Ljustorp's *tingslag* (Hellbom 1972: 9). The question is if the *skeppslag* as superior territorial organization in Norrland regionally had the concrete background in the *ledung*, which is accepted at least for Hälsingland (Jonsson 1971: 160 f), or if only the term itself was borrowed from the Svea provinces as a technical term for a judicial and/or fiscal organization. The by Hafström formulated understanding about the relation between the concepts twelfth, hundred and *skeppslag* (Jonsson 1971: 25 f), where the (normal) hundred consists of 8 twelfths, 2 *skeppslag* or 96 standard holdings, makes a connection to the Svea province's hundred division natural, no matter which term is used. Hyenstrand (1974: 154) considers - most nearly in connection to Söderlind and Hannerberg (Jonsson 1971: 25, Hyenstrand 1974: 33 f) - that the large hundred of approximately 120 standard holdings (or hamlets) has composed the original, higher, territorial unit which gradually through division or separation of the *skeppslag* came to give rise to the known hundreds in the historical sources. Different numbers of units may be adapted to different points in these models, for example 24 = double twelfth, 48 = *skeppslag*, 60 = half of a large hundred and 96 = normal hundred. Are there any imaginable connections between Medelpad's judicial districts and these number series?

The two *skeppslag*, Tuna and Skön, with a pronounced settlement historical central point in the Iron Age seem at the beginning of the Middle Ages to be able to have a number of units, which closely resemble half a large hundred, while the others at this point in time hardly may have any relation to the values in question. Njurunda *skeppslag*, which consists of one single parish, is probably too large for a double twelfth at this period and the whole of Torp's *skeppslag*, which has a similar value, might have a too dispersed settlement in order to be expressed only in a twelfth terminology. At the beginning of Modern times, the values for four *skeppslag* - anticipating the above mentioned correction - lie between 70 and 80 units. It is then theoretically possible that these four *skeppslag* at an unknown, between point in time have had a comparable size equalling approximately 60 units. The prerequisites for this lie in, among others, the rate and the development of the Medieval colonization, which are not known but have been of considerably greater extent in Torp's and Ljustorp's *skeppslag*. Indal's *skeppslag* may, however, never reach this number and Njurunda falls completely outside such an imagined norm. One might, however, be tempted to propose a hypothesis that the whole province in a defined but unknown Medieval period may have had a size, approximately comparable to 2.5 large hundreds or 3 normal hundreds,

that is to say, 300 settlement units (standard holdings), since the two sums' boundary values are 201 respectively 382. It may in passing be noticed that Westin on a fiscal basis, originating in the six years' tithes 1314 and a later, mobile fourth division, has constructed a completely different *skepps-lag* division (Jonsson 1971: 200 f), which from the viewpoints expressed here appear less probable.

One must ask the question what the practical goal with a uniformity in the *skeppslag's* size might be. If the *skeppslag* were a fiscal unit - for example as a replacement for the duty the *ledung* had constituted - with responsibility for a defined tax, extracted after land measure, "man" number or in another way, a similarity in this respect would be natural. The late Medieval statute tax of 300 *mark*, which is known in Medelpad, concerned, however, the whole province without known minor units and not either Hälsingland's Law's direction on relief of naval duty (*ledungslame*) knows any such units (Wessén 1968: 112 f, Hellbom 1972: 292, Jonsson 1971: 163 and 192). The size of the statute tax may be compared with the above mentioned, at a certain point in time probable total number of 300 settlement units, without a causal connection between these values being finally evidenced. Its character of a province tax should, through this, however be given a seemingly satisfactory, simply numerical explanation. A function solely as judicial districts need, however, hardly to prerequire a numerical or fiscal unity between the *skeppslag*. Such a function may quite as well be based on the topographically given, settled areas. I am, therefore, inclined to assume that Medelpad's *skeppslag* simply are judicial districts with a borrowed term and that the oldest known taxation was applied according to the number of standard holdings in the whole province. Under these conditions to try in the late Medieval *skeppslag* of different sizes to read in a numerical order of higher organization on the basis of settlement units, which might be brought back to prehistoric times would mean pressing the source situation too violently.

This does not mean, however, that the appearance of a spatial organization on a higher level is excluded in the Iron Age - even if it, like the organization on the twelfth level, at the time being may be considered unevidenced. It may, therefore, not either be fully established if it was built upon settlement units or fiscal data, or - most likely - if it was simply topographically or communicatively conditioned. The same ignorance prevails concerning an eventual organization for the whole province during the Iron Age. Such a one might nearly correspond to the Upplandic *folkland* or Clarke's above mentioned "tribal region". The need of a higher organization might in the first place

have lain in the judicial area while the fiscal duties were managed by the king's representative. During the Middle Ages there is, in any case, an organization on both these levels (Hellbom 1972: 273 f and 289, Wessén 1968: 136 f).

6. Culture processual model

The purpose of this concluding section is to, if possible, try to interpret, search for explanations to or at least a context in the cultural development - expressed in a traditional term - within the river valley as this is mirrored in the two cultural systems hunting and agrarian culture. One may express this so that the systems model now is applied on a higher level (compare Fig. 8 above), where the relations between the systems in question treated so far will be the object for investigation. As integrating elements in this concluding problem complex are included, among others, questions on the co-operation and eventual conflicts between the cultural systems, the question of whether cultural diffusion or internal innovation best explains the cultural course of development and the question of how the known society of historical times best may be understood from the earlier development. One important following problem at the treatment of these relationships is also the difficult question of the cultural system's ethnical background. A treatment of these explanative questions brings forth, as an introduction, a brief clearing of my attitude to certain current scientific theoretical and methodical questions.

6.1 SOME THEORETICAL PRINCIPLES

One of the basic questions in this context is the approach to the task of the scientific explanation - of course with special consideration to archaeology. Shall a scientific explanation within archaeology in the first place intend to explain general laws for cultural development - or, if you like, evolution - that is to find and treat examples of a general anthropological behavioural pattern, or shall it, on the contrary, try to explain specific, in time and space locally fixed historical situations or developments? Shall archaeology, in other words, seek a general anthropological or a particularistic historical explanation for its source material? The latter goal may ultimately be brought back to the aspiration of the idealistic school of history to find out "wie es eigentlich gewesen" (Torstendahl 1971: 32 f), and this has earlier also been expressed in the formulation of archaeological programs (for example Clark 1957: 17, Eggers 1959: 272 ff). The anthropological explanation methods have, on the other hand, much in common with that school of archaeology, which in the cultural interpretations' methods emphasizes the ethnological analogy (for example Moberg 1969: 159 ff, Watson et al.

1971: 49 ff, Binford 1972: 33 ff and 59 ff) or even mentions the study of extinct cultural systems "paleoethnology" (Thomas 1974: 1). In these contexts, as a rule, a "culture-processual" view of the cultural systems is emphasized in a continuous opposition to a putative previous "culture-historical" (Watson et al. 1971:165, Binford 1972: 81 ff and 213 ff, Watson 1973: 113, Thomas 1974: 57 ff). This processual theory has, in turn, the basic view in common with a positivistic scientific tradition where conformity to law and material historical factors are emphasized (Torstendahl 1971: 34 f).

The theoretical basis for the scientific explanation acquires, in a pure case, with a culture-processual approach a monothetic charachter and with a culture-particularistical approach an ideographic character (Torstendahl 1971: 31 f, Binford 1972: 114 f). These two main research lines are often considered - although this is not necessary - to be connected to a deductive respectively an inductive research method. Certain neo-archaeologists have, based upon Hempel's epistemological theory, programmatically maintained that archaeology is strictly scientific only when applying a strictly hypothetic-deductive method (Fritz & Plog 1970: 406 f, Watson et al. 1971: 3 ff, Binford 1972: 89 ff) with the clearly expressed purpose of formulating general, "covering" laws for the cultural process or for human behaviour in general (Fritz & Plog 1970: 405, Watson et al. 1971: 23 f, Binford 1972: 199). The archaeological source material is then, if anything, to be considered as a cognitive data bank or a general experimental workshop for principle studies of human and cultural behaviour. From a philosophical point of view have, however, serious objections been directed towards a purely nomothetical scientific theory with only hypothetic-deductive methods (Morgan 1973: 264 ff) and above all towards the neo-archaeologists' use and presentation of this (Morgan 1973: 267 ff). In that connection is also maintained that the scientific explanation is more of a means to reach knowledge than an aim in itself, and that a traditional historical method may be used in the same purpose (Morgan 1973: 273 ff).

One has also from a well-informed archaeological quarter maintained that the logico-deductive reasoning is that part of the new archaeology which seems most dispensable (Willy & Sabloff 1974: 193 ff). One may simply too one-sided have stressed the Hempelian theories without having satisfactorily tried alternative epistemological determinations of attitude. In connection to Meehan, it is here instead recommended an "explanatory systems paradigm", which also may be adapted to "empirical systems models with known degrees of statistical probability" (Willey & Sabloff 1974: 195) - that is to say, a union of the systems theoretical and the probability reasoning. Within the frame for this proposition the latter mentioned statistical method may not

be applied but the systems theoretical and empirical factors may at least in principle be united with a more historically/causally directed explanation method.

For advocators for a more historically directed method exist also in modern archaeology, which does not mean that one prefers one, in the worst meaning, traditional, inductive or intuitive accumulation of artefact data with subjectively qualitative preferences (Redman 1973: 6). A historic processual approach has, moreover, in a Scandinavian context early been maintained by Gjessing (1951: 224). Even with a more historical attitude one may accept and apply theories and methods which are used within processual archaeology, for example the necessity of conscious formulations of problems, formulating hypotheses and deductive tests of these (for formalities see for example Hill 1972: 63). Within the new archaeology one seems to have ignored that modern historical methods often work under similar theoretical prerequisites, for example concerning explanation methods (Trigger 1973: 97 f, compare Torstendahl 1971: 159 ff). The difference appears in the first case to be that the new archaeological school excludes other bases of explanation than the nomothetical, that is to say, "covering laws" according to Hempel's epistemology (Watson et al. 1971: 5 ff, Binford 1972: 22), while historians, certainly, may consider that such ones are of limited usage in certain cases but that they, as a rule, either become general, almost up to nonsensicality, or also impossible as derivations for historically applicable explanations (Torstendahl 1971: 174 f). "At present, however, most higher level generalizations tend to be trivial, not generally accepted, or both" (Trigger 1973: 100). One may doubt the value of comparison with natural laws which in practice have a 100 % predictivityif one must surround the "covering" laws with reservations as "successive approximations", "potential", "most likely outcome" and "most frequently" (Thomas 1974: 60). The accentuation of archaeology as a social science with sociological approaches implies in most circumstances that the explanations receive a greater degree of generality but this may be explained as well on empirical grounds as with nomothetical theories (Trigger 1973: 104).

For the limited purpose to try and formulate explanations for the cultural development in the Ljungan Valley and in the rest of Medelpad during the prehistoric times, I find the following summarized considerations in these epistemological and theoretical questions reasonable. The above discussion for the two - or originally three - cultural systems had as one of its main points of origin a human-ecological basic view of culture with an accent on adaptive and behavioural points (3 introduction). Such a cultural attitude

excludes both natural determinism, in which case the habitat should be wholly deciding for cultural development, and a purely anthropocentrical understanding, which in principle should prerequire a pure normative culture concept (for example Hill 1972: 74, Binford 1972: 213 f). An adaptive, multivariable and socially integrated cultural system (Binford 1972: 198) must, however, to a great degree be dependent upon local and temporary ecological conditions. Already the changes in this respect both in space and in time make, therefore, general "covering laws" in the meaning of the natural sciences improbable as general basis of explanation to all cultural development. If the laws are reformulated, changed or modified in connection with the multiply changing environments they loose their general applicability and with this the quality of covering laws. With a historical term one may then possibly say that they may constitute "explanative trends" (Torstendahl 1971: 129 f), which have appeared through successive corrections of the facts.

From social points of view the cultural systems' development, on the other hand, must be conditioned by the character of the bordering systems, from which influences in the form of immigration, diffusion, exchange, redistribution, and the like may be expected or demonstrated to come. These double conditionings from environmental and social viewpoints correspond in principle to the comprehensive "static and schematic model of the dynamic equilibrium"(!) which Clarke (1968: 125) constructed in order to clarify a cultural system's total situation. Hence one does not need to accept the model in all details - above all not the anomaly "material culture subsystem". The model as such is, however, more descriptive than explanative. If one therefore, according to the above, doubts the "covering laws" as an explanation basis, then an alternative foundation must be applied.

The above mentioned conditionings from both an environmental and a social viewpoint - and probably also from other viewpoints - constitute, as a matter of fact, typical examples of the factors an historian applies in a causally explanative reasoning (Torstendahl 1971: 161 ff). The explanation itself is not evident from the source material - or from eventual deduced "laws" behind it - but is a product of the causal reasoning with an adjustment between different factors of which certain ones are more necessary than others. At the lack of surely specified factors - that is to say, of sufficiently exact source material - or at competitive factors, one must also be able to adopt indications in the formulation of evidence, that is to say, probability reasoning (Torstendahl 1971: 150). From this follows that not seldom different, alternative possibilities with different probabilities or competitive explanations appear, without being able to give precedence to a single one.

Hence also the general predictivity, which is considered to lie in the explanations through "covering laws", will become less probable (Trigger 1973: 106 f). I consider, therefore, that Trigger's recommendation for "how possibly" explanations instead of "why necessarily" ones ought to be applicable also for this investigation area (1973: 107). First such an explanation model also does the flexibility, variation and complexity in the many-sided source material full justice. "An understanding of the past can be derived only by explaining the evidence of the past as it has survived in the archaeological record" (Trigger 1973: 108).

A successive question then grows evident: is not such a historically influenced explanation model also of necessity accompanied by a particularistical or even a subjectively qualitative view of the cultural development, that is to say, that this should consist of a more or less disconnected or continuous sequence of events, of which each demands its own explanation, instead of one variable but integrated and continuous process? In my opinion that does not need to be the case - above all because of two reasons. The above mentioned and in this work continually proposed human ecological approach includes, as already mentioned, that the cultural development must be seen as strongly conditioned by the ecological prerequisites. Those, of course, pass through certain changes during postglacial times, but these are slow and successive and the conditions in these respects are, therefore, very stable - in any case measured in understandable human measurements like generations or centuries. Already the strong connection to these factors, therefore, brings forth that the cultural development acquires a more processual than a capriciously particularistic direction by leaps. That does not mean, however, that an exaggerated culture-ecological standpoint for which "human cultures are only one part in a higher order, cultural-biological-physical environmental system" (Santley & Turner 1977: 747) is accepted without reservations. The other reason lies in the attitude to and the definition of "the historically significant" (Torstendahl 1971: 20). One may very well maintain that the concentration on political history, which an idealistic school of history traditionally recommended, was directed towards, from a development-historical point of view, far less important causes to the processual course than for example populative and social relationships, material conditions, subsistence and economy as these were maintained by the positivism (Torstendahl 1971: 33 ff) without, therefore, being forced to use a nomothetical explanation method. One may then accept two of the new archaeology's "three basic approaches and characteristics: culture evolutionary theory and systems theory" without applying the third: "logico-deductive

reasoning" (Willey & Sabloff 1974: 189). Theory and method, then do not need to accompany one another. The concentration upon the non-individual, upon the typical and general, upon the material conditions of man and culture process and upon the connection to the environment which lies in the archaeological source materials' own nature constitutes a basic prerequisite for a processual or evolutional view of the cultural development (Willey & Sabloff 1974: 182). A sometimes postulated uniqueness of cultural historical events is often illusory: "The complexity of the variables involved in concrete sociocultural relationships explains the often claimed uniqueness of historical events..." (Trigger 1973: 103).

History - or in any case this very important part of it, which in traditional contexts are named cultural history - may be defined as a continuous, multivariable process of social and human-ecological nature within which the chain of events of more or less frequent type - in pure exceptional cases possibly also unique - constitute integrated but subordinated parts. For each such partial process may, depending upon the source material, bases of explanation be sought for by different methodical and causal principles - for example within economical, social and demographic relationships within the studied societal system (Renfrew 1973: 112 ff) or through ethnological analogies - but within the frames, which the greater processual development allows (Trigger 1973: 99). It is clear that this greater development may get evolutional characteristics or be interpreted in such terms without that necessarily needing to be considered as a basis of explanation (Binford 1972: 105 ff, Trigger 1973: 102 f, Willey & Sabloff 1974: 178 ff). It is not impossible that such causal explanations also may acquire greater or smaller anthropological generality, but that ought, in the first place, not to depend upon that they are following any general laws but upon that the human ecological conditions of the area of investigation have many parallels within other areas and upon that ethnical connections and similarities may appear between different areas (Renfrew 1973: 252). In this connection it is also accepted that the conditions for similarities are greatest between areas lying near each other with similar human-ecological and ethnic prerequisites. The explanations which may be discussed for the Ljungan Valley may, therefore, probably in addition in the first place be applicable for the nearby Norrlandic river valleys - or at least have a high degree of predicitivity for investigations within these.

It has above been made clear that the here promoted understanding most closely is connected to Trigger's reconsilable theoretical standpoint (1973), as well as to Renfrew's apprehension of the important causal factors (1973: 109 ff).

This in a larger context greatly detailed case lies within Trigger's fourth and most important sub-purpose for archaeology, namely "to explain the past" (1973: 111) within the Ljungan Valley. An advocate for the new archaeology has also conceded that both a nomothetic and a particularistic investigation may be executed scientifically relevant and that both methods are needed (Watson 1973: 122). This limited investigation ought to take advantage of standpoints from both of these directions.

6.2 CHRONOLOGICAL SURVEY

An attempt to explanation of the cultural process must be proceeded by specifications of the chronological source situation within different periods and different systems. For processual change must be measured as change between states during different epochs or at different points in time (Moberg 1975: 362).

The present available chronological sources shall here be specified to cultural systems and periods with emphasis upon those where connections between the hunting culture and the agrarian culture are imaginable. For the sake of completeness and background, however, even known datings within earlier main epochs shall be given. The datings are, for natural reasons, in this compendious context unprecise. They are all principally of an indirect character and have both qualitative and quantitative elements (Malmer 1968: 87 ff).

6.2.1 The Mesolithic

For only a couple of decades ago, one considered that the Stone Age dwelling sites in Norrland could be dated earliest to the Neolithic times (Janson in Janson & Hvarfner 1966: 22). Today, a number of datings to the Mesolithic period have been put forward and several such are, because of parallels with the known cases, probable. Such datings appear in several different river systems (Baudou 1977: 32), among which are marked some in the Ljungan Valley.

Sundlin has, in the preliminary reworking, not been able to date any complete dwelling sites to the Mesolithic times, but above all in the surveyed material there is evidence which in places imply temporary residence here during this early epoch on dwelling sites, which probably also were visited on repeated occasions much later. In this manner, there are burins in the quartz material from Nästeljsön, Rätansjön and Handsjön (Sundlin: Rätan 172, 58 and 89) and keeled scrapers from Skålsjön and Holmsjön (Sundlin: Klövsjö 23 and Haverö 140). In NTB's excavations in Haverö two dwelling sites through finds of keeled scrapers have dated residence to the Mesolithic times (Baudou 1977:

108 f, 1978: 10, 13, 15). In Ljusnan's neighbouring river system, there are considerably richer Mesolithic finds from an excavated dwelling site with, in addition to keeled scrapers, among others also micro-cores and microliths (Gräslund 1970: 143 f). Similar stray finds are also known from immediately N of the Ljungan Valley (Gräslund 1970: 145) and keeled scrapers are also to be found in the later made surveying finds from the Ljusnan river basin. In upper Dalarna such mesolithic implements are relatively frequent (Lannerbro 1976: esp 52 ff and 70). Considerably farther N, there exist within Västerbotten very early C 14 datings for reliably stratified finds with artefacts of this type (Baudou 1977: 32 with op.cit., compare also Christiansson 1974: 31 ff). The datings of these artefact types seem, therefore, chronologically to be completely comparable with those of S Scandinavia (compare Lannerbro 1976: 70). Even the connection to the contemporary sea level may, in Västerbotten, give clear mesolithic datings of dwelling sites (Christiansson 1973: 60 ff). The extent of the mesolithic residence in the Ljungan Valley is, then, at present impossible to establish. In this context, it is sufficient that it is definitely evidenced in several of the richest dwelling site lakes in the middle part of the river basin. There is reason to presume that investigations here, under favourable conditions, might expose more dwelling sites with mesolithic residence.

Of the above mentioned stray finds, only one might surely be dated to the Mesolithic times, that is the bone harpoon-head from Klövsjön (4.1.3 with op.cit.). The approximately 20 pecked axes or similar axes are also of interest in this context, since some of these might go back to the Mesolithic times (Baudou 1977: 40 f). They appear partially in a concentration near Hornsjön in Njurunda, located about 80 meters above SL, and partially within the inland parishes Haverö, Borgsjö and Holm. If the former originate from a coastal dwelling site, the level means a dating to the Mesolithic times. This may, however, not be evidenced without excavation since the pecked axes in the inland evidently lie on levels which prerequire fresh water dwelling sites and which, therefore, also may be later. This may of analogous reasons, therefore, also apply to Hornsjön (Selinge 1975: 27). An indication of great age gives, however, the probable absence of such axes on lower levels in the coastal area (Baudou 1977: 40). Mesolithic residence may, then, have appeared within the whole river basin even if it reasonably was sparse and distributed.

The Mesolithic times might, from a nature historical point of view, predominantly fall within the Atlantic period, when the vegetation was considerably more influenced from the S than now with rich appearances of deciduous trees - also of precious species as hazel and elm - and a tendency to the

formation of brown soil instead of the now normal podsol soil profiles. A climatic maximum of the Atlantic type was reached, however, first during the nearest following period towards 3 000 B.C. (Engelmark 1978: 42 f).

6.2.2 Early and Middle Neolithic

It is not easy in excavated and still less in surveyed dwelling site material, exactly to distinguish what belongs to this period, which according to current chronology approximately ought to encompass the long time of 4 200 - 1 800 B.C. (Baudou 1977: 21). For the flake material within the basin of Ångermanälven, the material combinations have shown to have chronological relevance within the stratified dwelling sites (Baudou 1977: 30 and 84, compare even 90). The quartz material is dominant in the earlier layers which ought to originate from this period. Neither stratified dwelling sites nor reworkings of this type occur, however, within the Ljungan Valley, and it must also be considered open, if the quartz dominance everywhere has this chronological importance or if chorological aspects on the choice of the material also may give this another meaning (Baudou 1977: 65 f, Selinge 1978: 3.4, compare above 4.1.2). If the results from the Ångermanälven should be applicable also here, many dwelling sites within the middle course with the center in Rätansjön must have a strong dominance for this time period. The material in these is dominated of "flakes and residual products" (Sundlin), which as types are not chronologically relevant. Among the artefacts scrapers dominate, which are difficult to date also within a rough chronological frame. No C 14 datings are available.

Certain artefact types on dated dwelling sites in Ångermanland also seem to mainly stem from this time. That above all applies to polished tanged points but also different types of knives of slate, which are datable to this time both at coastal dwelling sites (Baudou 1977: 42 ff) and inland dwelling sites (Baudou 1977: 72 f, 83 ff, 90, 96 ff). It has also been suggested that knives and points of slate - among others, of the types which are found at the Bellsås and Överveda sites - shall make up leading artefacts for the late Stone Age "in large areas of Scandinavia" (Bakka 1976: 17 ff). If Bakka's supposition that tanged and barbed arrowheads earliest were produced in Trøndelag (op. cit. 20) should be correct, that may be of interest also from the viewpoint of the Ljungan Valley. Slate objects are - believably because of the soft stone - generally unusual in the surveyed material amounts but such points are found in Ljungan at dwelling sites in Storsjön and Klövsjön (Sundlin: Storsjö 4 and Klövsjö 36). In addition, points or knives of slate are found within eight parishes in Medelpad, included in the above treated stray finds of N Scandinavian types. Slate objects ought, therefore, to be met with within

the whole valley even if they to date are not usual.

The above mentioned stray finds of S Scandinavian type include at least some 15 finds - mainly axes - with traditional dating to this period. They are distributed within eight parishes in Medelpad from the coast to the inland and a couple of such are also found within the Jämtland part. Even the stray finds speak for, then, that dwelling sites from this time ought to exist within the whole river valley, and one does not have reason to expect that objects of S Scandinavian types with Early or Middle Neolithic dating should be later here than farther S.

As above (4.1.2) was mentioned, there exists in the coastal area - with definite evidence to date only from Tuna parish - paleobotanical evidence that a highly sporadic cultivation of cereals appeared possibly as early as the early Neolithic times, dated earliest to the first part of the 3rd millenium B.C. (Engelmark 1978 B: 9). It is met with in the same layer as pollen from a somewhat more open landscape, probably conditioned by animal husbandry (Engelmark 1978: 45).The dating of this, in a functional meaning, neolithic characteristic in the cultural environment seems in large to speak for contemporaneousness with the import of struck, thickbutted flint axes, which above all are known in upper Norrland but which are also evidenced here in the form of a lesser deposit in Hässjö parish (above 4.1.3, Christiansson 1974: 27 f, Baudou 1977: 51). Sure evidence of agriculture at this find location is, however, still lacking but from a chronological viewpoint is here the relative contemporaneousness of importance as an indication of a possible diffusion of the neolithic elements.

In conclusion ought - still nearly as a curiosity - be mentioned that the earliest known grave construction within the Norrlandic area is found in Medelpad and probably ought to be dated to this time (Baudou 1977: 45 ff with op.cit.) even if a dating to the nearest following period ought not to be completely eliminated (Selinge 1975: 37). Only one grave hardly allows any conclusions about ideal or religious contexts.

Vegetation and climate was, during this time, markedly dominated by the warmer period with a climate maximum in the late Atlantic time before 3 000 B.C. During the Sub-Boreal time a somewhat drier climate prevailed with increased pine and less deciduous forest vegetation in the inland but with deciduous dominance and a more maritime climate in the coastal areas (Engelmark 1978: 43 f).

6.2.3 Late Neolithic and Bronze Age

It ought to be presupposed that many dwelling sites which were visited during the earlier Neolithic times also continually at times were in use during the Late Neolithic and Bronze Age, without that needing to have left any more marked traces in the find material or the dwelling site character. In many parts of Norrland are, however, during this time a renewal within the stone technology and within the object composition evident (Baudou 1977: 144 f). The technological innovation express itself in a finer striking technique with surface retouching, often with parallel strikes, which give a flake material of small, thin flakes and splinters (Early Norrland code B7c, Meschke 1977: 16, Lannerbro 1976: 61). The most marked type of object, which is produced of both quartz and quartzite in this technique, is an arrow point with thin edges, lens-shaped or gently ridged profile and straight or somewhat concave base (Tennander 1972: 21 f). In slate at the same time appears at least on certain dwelling sites a polished point without tang but with a polished fluting in the base (Tennander 1972: 20). At many large dwelling sites the new striking technique appears dominating in other rock types than quartz, foremost quartzite and brecchia quartz (for example Baudou 1977: 30 f, 73 f, 83 f, 90 - Lemnäset). In above all surveyed materials and stray finds are, however, even quartz usual in these points and in such flakes (for example Meschke 1977: 55, 61 f, 75 f, 89 f, with others). As a chronological reworking a relative or procentual appearance of this technique in not too small extent might be requisite in order to surely evidence residence during this time, since a certain per cent of such flakes always may appear as random (compare Baudou 1970: 11). Many dwelling sites have, however, normally repeated residence in different frequency during different times, why modest relative appearance does not exclude residence during this time.

A complete review of all surveyed material is still lacking for Ljungan. Sundlin has, however, inspected material from all the lakes with dwelling sites. It may be observed that the new strike technique is met in all cases. The surveyed materials show, however, usually relative amounts of probably non-significant type and in a couple of cases with greater material (Åsarna Raä 2 and 3) this strike technique is only sporadically met. In two of the seven excavated dwelling sites (Sundlin: Storsjö 4 and Åsarna 28) is this technique dominant and joined with numerous points of this type. In one dwelling site (Sundlin: Rätan 145) there is a number of points of this type but no dominance of this flake material, and in two (Sundlin: Klövsjö 21 and 22) there is a certain amount of flake material of this type. As one, because of the size of the flakes, may expect this flake material seems to acquire

a relatively greater part after excavations. Any definite conclusion is, therefore, difficult to draw with so few excavations. Probably, however, during this time residence took place along the whole river system, and in certain dwelling sites remains from this time may make up the completely dominating material which, then, may mean residence only or mainly during this time. The relative richness of this material ought also to be seen in relation to this period's relative shortness in comparison with the previous ones. It might, therefore, be justified to count on the posssibility that this may mean an increased intensity in the area's exploitation - that is to say, probably a somewhat increased population.

Clear southerly elements appear distributed in the whole valley among the above mentioned stray finds from this time, among others just less than ten knives and some points of flint and some ten shaft hole axes. Bronzes of southerly origin appear foremost in the coastal areas (Hallström 1924: 275) but in a few cases also in the inland (Selinge 1970: 22 f and 1975: 31).

The other great innovation during this time period is that a burial tradition generally appears, although strictly limited to the contemporary coast and with the graves extremely connected to the shore. These graves are reviewed above (4.2.2), likewise a discussion is carried out about their cultural context and social indications (5.2.1). The dating has been treated in other contexts in connection to the level relationships (Selinge 1973: 222 and JBV: 389 ff). The graves begin probably to be constructed between 2 000 and 1 500 B.C. and reach a marked maximum during several centuries around 1 000 B.C. A few graves seem to be constructed around 500 B.C. while a new, less marked maximum is met first during the next period. The datings for the former, greater maximum seem to agree relatively well with the above mentioned expansive phase in the inland's hunting culture (Baudou 1977: 147 f). This may be interpreted as an indication that the above (5.2.2) as plausible judged hypothesis of a cultural relationship between the coast and the inland still during the Bronze Age may be correct.

The very sporadic pollen analytical indications of agriculture and clearance in the coastal area continue during the early Bronze Age in the same way as during the Neolithic time, while a somewhat more powerful expansion is visible during a shorter period in the latest Bronze Age (Engelmark 1978: 45 f). At the same time there are for the first time signs of clearance - however, not reliable signs of agriculture - in the Haverö area, where the only inland sites with pollen analyses are located (Engelmark 1978: 45). This has been interpreted as a considerable increase in above all the cleared

surfaces' extension, while the importance of cereal cultivation reasonably may not be much greater and in any case in principle of the same type as during the Neolithic time (Engelmark 1978 B: 10). During all of this time the Sub-Boreal climate of the earlier mentioned type existed, however, with some decline around 1 500 B.C. and the appearance of spruce vegetation in the coastal area around 800 B.C. (Engelmark 1978: 44).

6.2.4 Early Iron Age

The Iron Age's entrance - according to traditional S Scandinavian terminology -is related to the last mentioned climate and vegetational development. The transition to the Sub-Atlantic period c. 500 B.C. is characterized all over by a decrease in temperature and increase of humidity, of the disappearance of the precious deciduous trees and of the dominance of spruce forests - especially in the coastal land (Engelmark 1978: 44). The earlier discussion on this period of worsening climate has for the Norrlandic archaeological situation been summarized by Hellman (1946). Fluctuations may probably have occurred in both directions during a longer time (JBV: 183 with op.cit.). After the beginning of our chronology the conditions are in large comparable with those of the present day (Baudou 1977: 35 f and JBV: 186 ff with op.cit.) even if temporary improvements in a lesser extent are imaginable - for example during the Viking Age and early Middle Ages.

A difficult but central problem is the question of the earlier hunting cultures' remaining existence during the Iron Age and the time extension for this. It may be noticed that at present no undisputable datings to the Iron Age occur on the typical hunting dwelling sites within the Ljungan Valley, neither in artefacts, C 14 datings nor in any other way. For a long time one has, however, observed indications of that dwelling sites, carrying stone artefacts, have been visited far down in the Iron Age within several Norrlandic river valleys (Janson in Janson & Hvarfner 1966: 26 ff and catalogue 121 ff, compare also Hvarfner 1957 B: 107 ff, Baudou 1977: 74 f, and for upper Norrland more complete Zachrisson 1976: 100 ff). A considerable part of these objects may stem from the late Iron Age and single ones probably also from the Middle Ages. During later years' surveys still more objects of this type have been found in Ljusnan's upper river basin (Jönsson 1978: 38, compare Selinge 1976: 65 f). The primary importance of these objects are that they establish residence at these dwelling sites during the Iron Age. Of human-ecological reasons and because of analogies with the use of the dwelling sites during the Stone Age, the purpose with this residence may not have been anything else than hunting, trapping and fishing. From the here presented viewpoints it is, then, important to declare that the hunting culture's

economical system, in any case in a limited extent, remained living at least down to the late Iron Age in the form of temporary and possibly seasonal residences at the old dwelling sites (compare Zachrisson 1976: 99). The practical and subsistence-economical function of these visits to the hunting places ought in principle to have been similar with the comparable sojourns during the Stone and Bronze Ages. The answer to the question, whether they also were included in a technically similar cultural system - and so also left behind a part of the same dwelling sites' stone artefacts - is depending upon the possibility of deciding where these peoples' other residential places were located and the character of their residence at these. Iron artefacts are, namely, as far as is known - possibly with one exception (Zachrisson 1976: 105 no. 508) - not included in stratified or other reliable combinations with stone artefacts (Baudou 1978: 2). This relationship is, however, applicable with almost the same regularity also to the different types of stone artefacts mutually. This question is, at present, not possible to definitively solve, but the fact that Iron Age artefacts seem to be most usual on dwelling sites with stone artefacts in upper Norrland - that is to say, within an area which is located very far from the contemporary permanent settlement - seems hardly to indicate that they should be the result of the farmers'occasional hunting journeys.

That the finds of these dwelling sites - equally little as on several solely earlier Stone Age dwelling sites - do not comprise closed finds (Baudou 1977: 27 f), is, therefore, a matter of course and this has as far as I know, never been proposed (compare Hvarfner 1957 B: 107, Janson in Janson & Hvarfner 1966: 28 and Janson 1964: 41). One usually considers nowadays (Baudou 1974: 41 and 1977: 29, compare Meinander 1969: 67) that the latest reliable dwelling site finds of Stone Age character are those which include C 14 dated asbestos ceramics from the centuries on both sides of our chronological beginning (Linder 1966: 147). As Linder proposes, these datings, however, concern the ceramics themselves and with the above given exception (compare Baudou 1977: 28) this does not either occur, as far as is known, in stratified, closed combinations with neither stone nor iron artefacts. From a source critical viewpoint, this ceramic dating does not either evidence the general appearance of a stone technology during the Iron Age,and one might purely theoretically imagine one or several "stone periods", one "ceramic period" (compare Linder 1966: 150) and one "iron period" after each other on these dwelling sites (for example at Nämforsen, Baudou 1977: 74). From upper Norrland there are several C 14 datings from hearths, etc. to the Iron Age or later time at those dwelling sites - also those without clear stratigraphical relationship

with the stone objects (Linder 1966: 149 ff, Zachrisson 1976: 98 f). At at least one N Finnish dwelling site, there are quartz tools in Medieval stratifications of Lappish character (Carpelan 1967: 74).

One must, therefore, in my opinion in the present unclear source situation, lay deciding importance upon the above mentioned human-ecological and spatial indications, which definitely speak for the fact that people periodically have resided on these places principally in the same purpose during the whole of this time - that is to say, from Mesolithic times and, at places, into the Middle Ages. From a cultural systematic viewpoint, then, all these dwelling sites principally belong to the system of the Norrlandic hunting culture also during the Iron Age. Until the contrast has been evidenced the possibility is also evidently open that a part of the stone artefacts may stem from the Iron Age in a chronological meaning (compare Hvarfner 1957 B: 110, Carpelan 1975: 30 f). This may apply to the Ljungan Valley as well as other river valleys - even if the possibility for this may be seen as less probable here than farther N.

To this period also belongs the earliest datings of graves at the lake shores, in the Ljungan Valley above all represented by the cemetery Krankmårtenhögen. The grave finds include no datable artefacts but the burial custom speaks for a dating to the early Iron Age. Six C 14 datings from central graves' cremations, distributed within the 29 constructions, show a distribution of the datings' averages between 380 B.C. and 95 A.D. (uncalibrated values, Ambrosiani unprinted). Since five of the datings are made on resin-tightenings, they may, according to archaeologically controllable datings, possibly be c. 150 years too old, which is why the given frame is considered to lie within the time 200 B.C. - 200 A.D. (Ambrosiani op.cit.). In this context, it is sufficient to establish that the cemetery with greatest probability in its entirety was constructed during the pre-Roman and early Roman Iron Age. Of the few datings which otherwise appear from lake graves within this river valley may only one grave with Migration Period ceramic on an islet in Revsundssjön be dated to the early Iron Age (Biörnstad 1962: 83). Two stone settings at Rätansjön gave no datable finds at the excavation. With Krankmårtenhögen comparable datings appear in the similar cemetery at Smalnäset, Lake Lossen in Ljusnan's river basin (Ambrosiani unprinted, compare Hvarfner 1962: 155 ff), and datings from the whole earlier Iron Age A.D. are met within Dalarna (Hyenstrand1974 B: 182, compare also Baudou 1978: 7 f). Of interest for the problem that was discussed in the nearest preceeding section, is also that single graves within the whole of this area may include stone artefacts (Serning 1966: 18, 150, 217, 235, Hvarfner 1962: 58 ff, Ambrosiani un-

printed). In any case, in a grave at Smalnäset dating and stratigraphy clearly are speaking for contemporaneousness of grave and stone objects and no dwelling site is evidenced at the place.

To this time belong, as above mentioned, also the later graves in the coastal environment with a marked level maximum during the Roman Iron Age. After that, all signs of an extremely coastally connected culture disappear. During the earlier Roman Iron Age, on the other hand, the later completely dominating sedentary and agrarian cultural form in the lower river valley begin its development - according to the present available datings with beginnings in the Tuna-Attmar settled area during the first century A.D. (JBV: 251 f) and with development of a settlement during the Roman Iron Age in all larger settled areas and in a couple of the smaller (JBV: 241 ff). Quantitatively, this settlement becomes quickly considerably more dense than all earlier within the river valley (compare Fig. 22 and 23 above). During the Migration Period, this expansion reaches a marked quantitative apex in the greater part of Medelpad's Iron Age settled areas while, thereafter, a retardation arises - all during the prerequisite that grave production is a representative measurement of settlement (JBV: 245 ff).

The Iron Age is begun with a marked decline in the natural scientific indications of an extensive and temporary agrarian or pastoral activity of the character which is evidenced for the late Bronze Age in the coastal land and the inland (Engelmark 1978: 46 and 1978 B: 11). During the centuries after the Birth of Christ, this sporadical pattern in the coastal area is replaced by continual and considerably more marked pollen curves for cultivated plants and weeds, which must be interpreted as evidence of an extensive sedentary agrarian settlement (Engelmark 1978: 46 and 1978 B: 11). This development has a clear continuity down into historic times. In the inland - represented by the Haverö area - may on the contrary, only very inconsiderable areas have been influenced by cultivation and/or clearing and livelihood by hunting must constantly have been the most important economical system (Engelmark 1978 B: 11, compare 4.1.4. above concerning Baudou's understanding).

6.2.5 Late Iron Age

Concerning the hunting culture is the view equivalent with that during the early Iron Age. A residence at certain hunting dwelling sites is then completely possible but not definitely evidenced. It seems reasonable that this, in such a case, is of lesser extent than during the earlier Iron Age - in any case in the Ljungan Valley and other areas in S and Middle Norrland. For it is possible that the hunting culture's probably successive extinction

begins earlier in Norrland's S parts than farther N, among others, because of the confrontation with more sedentary cultural systems (compare Selinge 1976: 65 ff, Baudou 1978: 23). In upper Norrland, a hunting cultural pattern is evidenced at a number of dwelling sites during this time - and surely also to the historical times - and connected to a probable Lappish or proto-Lappish population (Zachrisson 1976: 98 f).

In the hunting culture's inland areas, there are some lake graves dated to this time. The Ljungan Valley's only registered barrow in this environment is, through finds, dated to the Viking Age (Baudou 1978: 12 ff through K. Hjortzberg), and a now almost destroyed ancient monument in the same lake has produced finds from the late Iron Age (Selinge 1970: 26). A spearpoint of a Viking Age type (Björkqvist 1934: 193) from a point in the lake Grötingen in Gimån may be derived from a destroyed grave (Raä Revsund 33). Graves of this type may, therefore, have been constructed here during both the earlier and later Iron Ages. The few of barrow character seem always later than those of cairn character (Selinge 1976: 44, 1978: 4.2). In Ljungan the latter dominate completely, and some difference in environment or location may not be evidenced. The graves, therefore, prove that the old hunting environments were visited still during the late Iron Age. Who these visitors were may, on the other hand, be discussed (compare Selinge 1976: 68 ff and Baudou 1978: 20 ff) - a discussion that belongs to the next chapter.

The agrarian sedentary culture continues during the late Iron Age. During the first time of the period is, however, a marked decline in grave production evidenced, which probably may depend upon a comparable decline in settlement (JBV: 247 f). Thereafter, follows a new expansion during the Viking Age (JBV: 242 f), which is evidenced to all of Medelpad's settled areas but is more marked in Ångermanland and in Jämtland around Storsjön(Selinge 1976: 47 f). The latter settled area lies to a modest part within Gimån's uppermost river basin where, within Lockne parish, at least one grave is evidenced to the Migration Period (Biörnstad 1962: 89) a couple of finds are from the Vendel Period (op.cit. 108 f) and several from the Viking Age (op.cit. 115 ff).

It is significant that the period of decline in the beginning of the late Iron Age also may be evidenced in the paleobotanical sources. In the diagram from Rudetjärn in Tuna parish there is, namely, a clear increase of both pine and spruce forests in the beginning of the late Iron Age (Engelmark 1978: 37). These curves are, certainly, continually characterized by temporary fluctuations, but it is of great principle interest that relative maxima for culturally influenced non-forest vegetation clearly lie partially in the end

of the early Iron Age, partially in the early Middle Ages and partially in the last part of Modern times. It is quite important that this view in the basic concepts agrees very well with the known development both archaeologically and historically. These three apexes, then, ought to correspond to the agrarian periods of expansion during the Migration Period, late Viking Age - early Middle Ages and the 18th and 19th centuries. In the inland's corresponding vegetation curves (Engelmark 1978: 33), on the other hand, there is hardly seen any such apex for non-forest vegetation preceeding that of the Middle Ages, and the Iron Age's curve has only fluctuations of the same size as during the earlier parts of prehistoric times.

In JBV (general map) and above (Fig. 18) has the extension of the Iron Age settled areas spatially been decided through the frequency of graves. These maps give a general, both spatial and chronological idea of the Iron Age's settlement development since everything indicates that the grave frequency in large is a function of the settlement period's length (JBV:248). It is highly probable that the historical period's hamlets and farms in spite of a temporary changing settlement development during both the Iron Age and Middle Ages may be continually derived from the corresponding units during the Iron Age (JBV: 325). If one desires, then, to have a picture of the extent of colonization and settlement at the end of the Iron Age, this may instead be measured in the number of historically known units - hamlets or farms - with preserved or in other ways known ancient monuments. Those units have been indicated on the map Fig. 26 which then gives an idea of the settlement within the Ljungan Valley at the end of the prehistoric period, represented by the hamlet location for each unit with prehistoric graves. On the map there are, in this way, 115 units in Medelpad marked according to the diagram and table Fig. 24-25 (Njurunda, Tuna and Torp's *skeppslag* and Sättna parish of Indal's *skeppslag*), and in addition, eight units within the central part of Lockne parish according to the above. A map with this descriptive frame gives the best foundation for comparisons with the following Medieval development.

6.2.6 The Middle Ages

Concerning the hunting culture may, principally, the same viewpoints be expressed for this period as for the late Iron Age. The probability of remaining rests of a pure hunting culture within these parts of Norrland decreases, however, steadily and must for this epoch, because of the agrarian expansion, be considered as rather small. Whether economic/ecological patterns from the hunting culture have influenced the sedentary agrarian culture or been absorbed in this as culture loans is a question which may be treated in relation with the

attempts to explanation models which will be set up in the following. On the other hand, shall here, as a follow-up of the previously, above all in JBV sketched development, a somewhat more thorough treatment be presented concerning the agrarian culture's spatial development during the Middle Ages.

The Medieval colonization may, in a spatial respect, easily be compared with that of the Iron Age settled areas by presenting a map of the same type as the last commented, on a foundation of historical sources. For this purpose, the above (5.3.3) mentioned tax records from the 1500's within Medelpad have been chosen (Hellbom 1972: 197 ff and Nordlander 1896: 123 ff), where all the then settled and populated units may be considered to be accounted for. For Jämtland a remarkable tax record (Sw. *jordebok*) from 1568 (Jämtländska räkenskaper II: 47 ff), drawn up by the Swedish administration during the Nordic seven-years' war, is used in an analogical way. This accounts, in addition to inhabited farms, also for a large number of taxed deserted farms under these. These were now,in a demographic meaning, abandoned but had previously been inhabited, and they ought, as a rule, to have been deserted during the late Middle Ages (Dybdahl 1972: 74). Many of these are recorded in the Register of Ancient Monuments because of their still preserved fossilized fields while others are recultivated during more Modern times (Selinge 1972: 124 f, and 1979: Ch. 10). Within the parishes of immediate interest, there is a total of 79 inhabited units - usually consisting of only one farm - and 62 deserted farms, called "*ödesgods*", recorded at the taxation. Some of these lie, however, outside the watersheds, here used as boundaries. The map does not, therefore, record the settlement at the middle of the 1500's but - with the exception of some non-localized deserted farms - the maximum extension which settlement in general had during the late Middle Ages within this part of Jämtland. It is, therefore, not completely evidenced that all of these farms were existing at the same time, but probably all are a result of a highly expansive early Medieval colonization wave, which during the late Middle Ages has been followed by a serious regression (Dybdahl 1972: 59 f). The map shows within the densest parts, on the whole, an optimal agrarian colonization, since not even modern colonization in several parishes in Jämtland reach up to the Medieval settlement extension in a numerical respect.

On the map Fig. 27 there are from these sources shown 83 units in Medelpad - and in addition one in Hälsingland (Modin 1949:270) - and c. 120 in Jämtland, which all are colonized during the Middle Ages. The total extent of sedentary agrarian settlement in the Ljungan Valley during the late Middle Ages and 1500's is composed then of totals of Fig. 26 and 27, that is to say, 198 units in Medelpad and c. 130 in Jämtland. Both by the maps and by these numbers a marked

difference between the provinces is clearly shown - or between Ljungan's main valley and the upper Gimån Valley - concerning the colonization's development. Within the lower Ljungan Valley there is a strong settlement already during the Iron Age - to all appearances to a greater part already during the early Iron Age (JBV: 241 ff) - while in the upper Gimån Valley during the Iron Age there is only an unimportant annex to the Storsjön settled area within the Indalsälven's river basin.

Within the Ljungan Valley the colonization within the lower part is rather unimportant during the Middle Ages - apparently depending upon that the area for the most part was completely colonized already during the Iron Age. On the other hand, there is a rather lively colonization in the inner river valley, which above all is concentrated to the area under the highest coastline in Borgsjö, Torp and Stöde parishes. The colonization upstream from this boundary, which is important according to the soils from an agrarian ecological point of view, within Haverö parish and the river valley's Jämtlandic part is, on the contrary, appearing only in places - a relationship which in general characterizes still the modern settlement picture. Even this view of a successive colonization up-country along the river valley speaks definitely against Baudou's thesis (1977: 110, 1977 B: 23 f, 1978: 20 ff), that the lake graves represent a distributed agrarian/pastoral colonization of a sedentary character within this area already during the first millenium A.D.

In the upper Gimån Valley, contrarily, the Medieval colonization is pronounced expansive and it had obviously such an extension that certain units lacked the prerequisites for a permanent and stable development when the late Medieval crisis development entered. Both the colonization and the desertation are interesting as settlement historical phenomena, but an attempt to explanation of these lies outside this investigation's purpose. Concerning the colonization is, however, a relation to the best cultivable soils obvious. In Medelpad, where the population pressure eventually was lower, is a concentration foremost to the area under the highest coastline clear (compare Fig. 1), while in Jämtland it is most dense within the Revsund area where the moraine's Cambrio-Silurian degree is greater than farther down along the valley (Lundqvist 1969: 37).

One may also ask if the disproportion between the colonization pictures in Medelpad and Jämtland is correct. A source of error might be imagined in that the taxation book of Jämtland in the contrary of those of Medelpad also records the deserted farms separately. On the other hand, it ought to lack

importance that it is a couple of decades later. May a late Medieval desertation have taken place in Medelpad which is not seen in the fiscal sources? Preserved deserted farms are neither known nor registered in the province - to the contrary of what was the case with Jämtland - but this might depend upon a nearest total and perhaps relatively quick re-cultivation. It is imaginable that certain fiscal sources may offer a control possibility of this situation and in this way probably of the settlement development during the The Middle Ages.

Jonsson (1971: 194 ff) has made a comparison between the numbers of *öre* in the parish list from the so-called six-years' tithes or the Vienne tithes 1314 (compare Hellbom 1972: 32 f) and the land measure in *mål* arable land in the tax book of 1543 (Nordlander 1896). The six-years' tithes is expressed in *öre* per vicariate, that is to say the main parish and an eventual annex, and it is not completely clear which utilities the tithes was intended to tax (Jonsson 1971: 164). The number of *mål* arable land in 1543 per *öre* tax 1314 also varies between 261 for Liden's vicariate and 536 for that of Selånger, but a correlations analysis shows a clear connection (Jonsson 1971: 195 f). With consideration to that the Medieval provincial tax was not counted in land measure but probably has a connection with the number of settlement units or the number of standard holdings (5.3.3 above), it is tempting to compare the information of the six-years' tithes not only with the 1500's fiscal values but also with its number of settlement units. Such a comparison has, namely, from a here important viewpoint, in addition the advantage of being able to bring back to the transition between the prehistoric times and the Middle Ages. Because of the six-years' tithes' basis of calculation the comparisons must be made on the level of "1314 vicariates", which do not agree with the above used *skeppslag* divisions but consist of 11 main parishes and probably 7 annexes (Jonsson 1971: 195)[1]. The vicariates' share in percent of the number of settlement units at the end of the prehistoric period and in the middle of the 1500's (Fig. 24 and 26-27) may, in this way, be compared with their share of the six-years' tithes of 1314 in the form of an extension of Jonsson's table (1971: 196). The values have been compiled in the table Fig. 28 where also the differences in percent are calculated.

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1) Njurunda, Stöde, Torp, Ljustorp and Indal parishes are own vicariates. Tuna has the annex Attmar, Borgsjö the annex Haverö, Selånger the annex Sättna, and Liden the annex Holm. Skön is indicated to have one annex which is accepted to be Alnö, while Timrå should have appeared later (Jonsson 1971: 193). It is, however, improbable for settlement historical reasons that Timrå should not have been its own parish at this time. It ought also to have constituted an annex to Skön. Hässjö includes according to Jonsson (1971: 194) also Tynderö, but this parish is clearly given as an annex to Hässjö in the list (Hellbom 1972: 33).

For a control of the settlement units of the 16th century (column d) two other values from the same source have also been calculated, namely the number of taxes holders of these units (column e) and the area of arable land in *mål* (column f), both calculated in the same percentual way. The number of nominati are somewhat changing in the two sources, as a rule somewhat lower in the aiding tax list of 1535 (Hellbom 1972: 197 ff) and somewhat higher in the taxation book (*jordebok*) of 1543 (Nordlander 1896: 123 ff). Here the highest value has been chosen, since it is clear that gaps appear in the records with the lower. Probably have, however, temporary changes appeared which, among others, is seen by the great number of outlying holdings (*utjordar*, compare JBV: 323 f). Jonsson (1971: 195 f) has demonstrated a strong numerical relationship between the six-years' tithes of 1314 and the area of arable land in 1543,in spite of the probable differing calculation bases. A distribution diagram for the relationship with the number of settlement units c. 1540 is somewhat more spread, but the correlations coefficient is 0.68 and thus still clearly positive. In the columns j and k it may be seen that the differences in the vicariates' relative share, as a rule, are not large, whether one compares the settlement units' number with the number of nominati or with the area of arable land. They may probably, to a large extent, be dependent upon the mentioned, believably temporary changes. Only three values need, because of their greater deviation, a comment. Njurunda, then has 3 % greater number of holders than number of settlement units, and Skön and Hässjö have 2.7 respectively 3.7 % lesser number of arable land than number of settlement units. In the former case there is, then, more holders per hamlet than normal and in the latter two cases the area of arable land per unit is smaller than normal. Both of these relationships are supported by the average number of *mål* arable land per nominatus 1543, which is the lowest just in these three vicariates namely between 21 and 24.6 *mål*. Only the three inland vicariates Torp, Borgsjö and Liden have, in addition, an average under 30 *mål* (26.1 - 28.6 *mål*), while the other 5 vicariates all have an average above 30 *mål* with Indal highest with 36.4 *mål*. I consider that the discussed relationships indicate that a comparison with the six-years' tithes is well worth an attempted test even in the number of settlement units.

In column g a relative comparison is made between the number of units with ancient monuments and the number of taxed units per vicariate in 1540. It is understood that the vicariates with Iron Age settlement decreased and the later colonized increased in share. The values express, then, the map's (Fig. 27) spatial picture in numbers. The six-years' tithes, which lies fairly exactly between these points in time, now give the possibility of controlling

during which part of the Middle Ages this development in general took place. This is seen in the columns h and i where two different tendencies clearly come into view. All of the vicariates with the large Iron Age settled areas have a marked decline in share until 1314, and this is most expressed in Skön where the number of Iron Age units is largest and the single units probably on the average smallest (JBV: 320). All other vicariates increase their share during this time. The increase is, however, unimportant in Indal and most marked in the inland vicariates, mainly colonized during the Middle Ages. The relationship is illustrated by the upper map in Fig. 29. During the period 1314 - 1540 (column i) all of the inland vicariates instead decrease their share while all coastal vicariates increase theirs. The relative increase lies, however, not only in the old Iron Age vicariates but also - and most obviously - in Hässjö, which differing from the other vicariates with marked Medieval colonization lies at the coast. The relationship is illustrated by the lower map of Fig. 29.

It is not excluded that a part of these tendencies from a settlement historical viewpoint is too expressed because of the six-years' tithes' possibly schematical character. The strong changes up and down for Stöde, Torp and Liden may partially be thought to depend upon that these vicariates were levied in relationship to their capacity too large a tithes, since just these vicariates have the lowest number of *mål* arable land in 1543 per *öre* tithes 1314 (Jonsson 1971: 195). One may, for example, have worked with established norms in *öre* amounts for the tithes, which in certain cases might be affected unequally. It is not impossible that the other sources, used by Jonsson and here, are a better measurement of the settlement development than the six-years' tithes. Even with this eventuality it is, however, probable that the two pronunced main tendencies are an expression for an underlying historical reality.

The relative decline in the coastal settled areas during the early Middle Ages may with the then probably governing prosperity not depend upon decreased settlement here, but it must be brought about by the increase in the inland. A certain expansion takes, moreover, place also in the coastal settled areas (Fig. 27) - reasonably during this strong expansive period. The relative decrease in the inland during the later Middle Ages may probably not either depend upon increased expansion in the coastal settlements - with exception of Hässjö - since these in large ought to have been fully colonized at this time. The only probable explanation is, therefore, that a certain settlement regression took place during the late Middle Ages and that this mainly affected the inland. Desertation of the same type as in Jämtland may, there-

fore, have appeared without leaving any traces in the fiscal sources. In Ångermanland, also, are relatively numerous "*ödebyar*" (deserted hamlets) recorded in the taxation book from the middle of the 16th century (Nordlander 1899: 184 ff). One possible example of desertation in Medelpad has earlier been discussed (JBV: 309 f), and several might possibly be found in historical and popular traditional sources. A recultivation, which may have appeared earlier than in Jämtland and may be comparable with the corresponding in Norway (compare Dybdahl 1972: 79), may be a contributive explanation to that so little is known about any desertation. It must also be judged as highly reasonable - disregarding the causes of the crisis - that a late Medieval agrarian crisis of the size, that over the whole of Jämtland considerably more than 300 farms were abandonded (Dybdahl 1972: 59 ff) and that probably a considerable number of hamlets were abandonded also in Ångermanland, would be marked also in Medelpad's inland. In several of the pollen diagrams from Medelpad there are also fluctuations which indicate increasing forest and decreasing open land and which may lie in the late Middle Ages (Engelmark 1978: 37, 54, 58). Even certain place names may be interpreted as indications of abandonment of a certain extent (Nordlander 1903: 253).

Of immediate interest in this context is that a Medieval development of this expansive-regressive character is important also as an analogy to the Iron Age's colonization and settlement history (JBV: 241 ff), such as this is measured in the grave production. I have earlier hypothetically interpreted the grave production's decrease during the Vendel Period as in the first place depending upon settlement historical reasons (JBV: 247 f), foremost with consideration to parallel and partially contemporary courses in other parts of Scandinavia. A possible analogy in agrarian cultural forms within the same or in any case nearby bordering areas with quite similar human-ecological conditions but during a later time may constitute still one more indication in the same direction. During these circumstances a general, hypothetical interpretation lies ready at hand, that a long-term, periodical - or perhaps cyclical - development within an agrarian cultural system in the respect of settlement history might be a fully "normal" development - in any case within agriculturally more marginal areas as these and during times, when the cultural system from this viewpoint of support completely built on the local prerequisites. The system's trajectory should, in such a case, follow the cycle: colonization - expansion - apex - stagnation - regression in order to, thereafter, eventually be repeated. The maximum state may, of course, during the different cycles be located upon completely different levels. In the area under discussion one has, in that case, two

cycles with expansion and apex, partially during the late Roman Iron Age and the Migration Period and partially during the later Viking Age and early Middle Ages, and stagnation and regression between and after these epochs. In any case, in Jämtland a marked increase, thereafter, is not obvious before the 1700's and especially in the 1800's (Rudberg 1957: 130 f, 133 f and 137 f, Selinge 1972: 121 f), when an expansion of earlier unknown craft and gradually during other conditions appear. The reasons behind these courses are, on the other hand, difficult to trace and may of course not have any conclusive solution in this context. One ought, however, to recognize the tendencies to similar, long-range trends concerning the paleo-botanically evidenced influence on the environment within other areas (Rønneseth 1974: 187, Welinder 1975: 68 f with op.cit., compare also 6.2.5 above and Engelmark 1978: 37). The task now becomes to formulate and discuss imaginable models for a preliminary explanation of the cultural systems development from the Mesolithic to the Middle Ages, where even these conditions ought to be considered.

6.3 TRIALS TO EXPLANATION

To achieve a conclusive or, in all cases, relevant explanation to the cultural system's dynamics is not possible. Differing from a model or another form of analogy for a static system it is here concerned to weigh different hypotheses against each other, in order to explain changes between different states and the causal conditions which have governed them (Rouse 1972: 194). Changes in the research situation in any course of the process always imply changes of the causal conditions within greater or smaller parts of this, which is why revisions always are necessary. It should, however, in today's situation, be unsatisfactory not to try to formulate at least suggestions to such processual hypotheses against the background of the sketched, more static, economic and social systems. These archaeological data must, then, be seen in relationship with the generally accepted theories for, in the first place, economical, but also social and demographical relationships and processes.

An integration of these types of information may suitably be made in the form of a dynamic model (Sherratt 1972: 480). In the model's abstract nature lies, however, that it constitutes a simplified construction, originating in its data contents. It might, therefore, be unsuitable in the point of departure to bind oneself to one hypothesis or one explanation model without discussing alternative ones. One has even considered it a scientific duty to give alternative explanations to the studied archaeological phenomena (Hagen 1970: 114). In the research situation today it is justified to discuss such alternatives partially from a more traditional and diffusionistic explanation method

and partially with a starting point in a more adaptive and innovative view of the cultural historical process (Renfrew 1973: 109 ff). The former has an obvious tradition in Norrlandic archaeology (Christiansson 1963: 11 ff), which - in addition to the base in its earlier dominance - also may originate in a common routine-like diffusionistic thinking "from south to north". This view has - without being principally referred to - been expressed also in the latest conclusions (Baudou 1974: 31 and 1977: 141, JBV: 412 ff). The latter is in large unproven in this area and it may, equally little as the previous one, of natural reasons never come to make up a universally prevailing explanation. It must, however - not least towards the one-sided research historical background - be worth a serious test against real facts and arguments. In order to analyse the validity in the two paradigms it is suitable to try to purefy them, though one empirically may predict that neither may be sufficient as a single explanation model.

I shall, therefore, try to construct two alternative models. Both are constructed upon the same basic variables, namely, partially those in the previous section to their contents specified chronological stages, partially the three spatial environments where the three originally sketched cultural systems are located: the coast, the river valley below the highest coastline and the higher located inland area, and partially the three archaeological source groups which are represented: ideal, functional and environmental sources (compare also Fig. 5). The models (Fig. 30 and 31) have an imagined orientation in the four cardinal points, and the Ljungan Valley is represented by a rectangular field which is repeated six time for the six chosen periods of time and for each time is divided into three horizontal fields for the source groups and three vertical for the spatial groups. Both cultural diffusion from outside and internal chronological development are shown with arrows, the former into the figure from the main points of the compass in the sides and the latter vertically between the stages. The quantity of the cultural elements is suggested completely subjectively through the arrow's width. A solid arrow marks an, according to the respective model, reliably established development or influence and a broken arrow marks in the same way a possible or alternative but unreliably established one. On the other hand the model does not show the direct kind of the external influences which may be, for example, migration, diffusion of cultural realities on a reciprocal, redistributive or mercantile basis or diffusion of ideas or other abstract cultural stimuli. The kind and direction of the influences may be discussed in each invidual case. In the innovative model a filled star shows, in an analogical way, a reliably evidenced internal innovation and an open star a

possible or alternative one. With two different - and in certain cases partial - shadings are given the appearance of cultures of sub-neolithic respectively agrarian/sedentary type, while pure hunting culture is unmarked. The stadial division is as all such ones only an incomplete aid - normally, of course, a cultural process does not take place between step-by-step periods but successively with more or less evidenced degree of continuity.

Both the construction of and the choices for the models may, in a certain way, be said to be subjective, since variations in emphasis and detailed formation may be imaginable. But the main frames for the models and the principal features of the development are objectively given in the above recorded situation in the investigation area's archaeological source system, and they are influenced by already previously made scientific interpretational attempts which are a research-historical fact. The models also recall, as objectively as possible, all relevant variables in the source critical situation. It means, therefore, no exaggeration to state that they objectively illustrate the basic prerequisites of today's research situation for an interpretation of the cultural-historical process in the river valley's prehistory. A choice between the two models or an evaluation of the validity of different elements in them must, on the other hand, to a dominating part be subjective. Such an attitude is obstructed, in addition, by the ethnical interpretation questions, which one conclusively may not omit in the Norrlandic prehistory (compare Christiansson 1969 C and Baudou 1974 and 1977: 141 ff). After an argumentation for the two models, which may be relatively changing in completeness depending upon what is research-historically well-known or what may be understood as principally new ideas, the research situation in this ethnical question will be commented, after which the subjective evaluation is given in the short form of a conclusive synthesis.

6.3.1 A traditional diffusionist model

To use the term diffusion as a cultural-historical explanation has been very common in connection to stilistical, morphological and other presupposed distribution mechanisms within earlier archaeology and bordering sciences. In the same way the term migration has been used in connection to foremost earlier phology (Sherratt 1973: 419 f). Both constitute, however, explanations only in a restricted and conventional meaning, and the procedure seems to invite fundamental difficulties of at least three kinds. The similarity between cultural units has, in the first place, often been interpreted as genetical relations without trying first sufficiently to solve the essential difficulties of to "distinguish between homologous and analogous cultural similarities" (Binford 1972: 81), which is of basic importance. Even if this

might have been the case and a factual relationship has been verified, that does not need, in the second place, to be evidence of anything else than that "contacts with a wider social environment" have occurred (Stiernquist 1971: 38 ff), while the type and direction of these connections are not given without further ado. Even if influences from a defined quarter, thirdly, conclusively may be established to type and direction, this means from a further cultural historical viewpoint no real explanation of a cultural historical process but only a removal of the explanation problem from one area to another (Renfrew 1973: 110). It is not difficult in archaeological literature to find examples of "explanations", which ignore all of these circumstances and, for example, make conclusions directly from subjectively chosen artefact complexes to historical constructions (for this area for example Åberg 1953) or construct migrations out of unevidenced hypotheses (for example in Malmer 1962: 677 ff op.cit.). It is likely also too human a temptation to refer to other areas with at first sight similar cultural contexts rather than trying to find an explanation within the investigation area itself, where the difficulties of cognitive reasons are easier to realize. It is, in other words, easy to push the problems from oneself. But it might, on the other hand, be unreasonable to demand that the cultural relations and contexts at each investigation should be elucidated with the same degree of carefulness within all imaginable related areas, which quickly should bring with it a precarious research situation. One may, however, formulate the problem in the way that a demand for conclusive evidences ought to be enjoined on them, which maintain external relationships as the cause of cultural change (Renfrew 1973: 112).

It is, however, not my intention in this context to try to present such an exhaustive evidence for all the external relationships which are illustrated in the model Fig. 30, partially because such a task is too encompassing with regard to the model's extent in time and partially because these relationships already previously to a greater or lesser degree of evidence are accounted for in the literature. In this fact, then, lies the traditional in this model. On the other hand, in a couple of cases a short reasoning shall be carried out about what the illustrated changes fundamentally may have implied from the viewpoint of the regional cultural system. With the model's prerequisites it is given that most of the arrows from outside here are marking as reliable accepted relationships.

For the Mesolithic times an immigration is given as an explanation of the genesis of the hunting culture in the area. To investigate the origin and the time for this lies, however, outside of the task in this context. Both

easterly and southerly immigration routes are noticed and partly verified against a background of the area's mesolithic object forms (Baudou 1974: 35 and 1977: 143 f). The former are descended foremost from the Suomusjärvi culture, which is mainly a maritime hunting culture (Luho 1967: 112). It has been dated to the time of 6 500 - 3 500 B.C. and has in its composition been interpreted as native in Finland (Luho 1967: 116) but with roots in areas farther towards the E - SE (Carpelan 1975: 17). Parallels are observed, among others, in Västerbotten (Christiansson 1974: 21 ff). It is probable that the use of quartz mainly may have come to the Ljungan Valley through these contacts.

Connections towards the S are to be found probably foremost by way of the inland, where the upper Ljusnan Valley is a probable passage area for southerly mesolithic forms to the more northerly parts of Norrland (Gräslund 1970: 144 f). Even upper Dalarna ought to be of importance in this context (Lannerbro 1976: 70). These forms might be derived from the Nöstvet culture, the Sandarna culture, the early Lihult culture or corresponding groups which in SW Scandinavia may be found both on the coast and in the inland (Cullberg 1972: 46 ff and 1975: 37 f, Indrelid 1975: 2 ff and 1977: 139 f, Mikkelsen 1975: 23 ff, Skjølsvold 1975: 209 f, compare Welinder 1973: 48 f). One has also pointed out that the geographical conditions invite partially possibilities of relationships between these areas and partially certain ecological analogies (Moberg 1965: 366 f). A third but more unreliably evidenced immigration route may be by way of the contemporary E coast where the pecked axes may speak for a cultural diffusion during in any case the late Mesolithic times (Baudou 1977: 143, compare Welinder 1973: 50).

The reason for the immigration must primarily be that a virgin hunting and trapping land was established in the river valley as soon as the plant and animal eco-systems were established in the area after the deglaciation. These conditions seem to have prevailed in the Boreal period during the course of the 7th millenium B.C. (Lundqvist 1969: 181 f, Engelmark 1978: 42 and 1978 B: 6). It ought to be presupposed that mesolithic hunting groups rather soon followed the big game's and the fish's immigration from areas, where both animals and men earlier were established. The hunting culture's economical and social systems (compare above 4.1 and 5.1) may mainly have existed even earlier and with the immigrating groups been established in and adapted to the area. An eventual internal development within these systems during this period, which is at least a couple of millenia long, is inaccessible with the sources used here but both possible and probable. In the present source situation spatial or chronological groupings may not be identified, and it is

probable that the culture's mobility and flexibility over large areas would make it difficult to distinguish such groupings even with better support of excavated dwelling sites (compare Indrelid 1975: 16 f and Cullberg 1975: 51).

A continued internal development may, therefore, be expected within these systems during Early and Middle Neolithic times. Dwelling sites were established probably in an increasing extent both in the inland and in the successively growing area in the coastal land and the lower river valley. New object types - above all in slate - are introduced according to this model, through continuous connections in previously established directions. These do, however, not need to have come through new immigrations but may be the result of a diffusion of technical innovations (compare Baudou 1977: 144). Knowledge, which is conveyed by way of such a diffusion, may also have involved that one began to exploit other local resources, for example dark quartzites in the upper river valley. The reason for the exchange of such information between hunting cultural groups in different areas ought primarily to lie in the hunting culture's mobile character. "Primary diffusion" occurs between and within closely related and closely located groups, "secondary diffusion" within groups of a higher order (Clarke 1968: 413 f). Groups with bordering or partially common territories were meeting more or less regularly at seasonal wanderings, through which exchange and diffusion of such experiences might take place successively. Secondary diffusion may also have been caused by or been greatly promoted by exogamous marriage traditions which greatly may have contributed to the mesolithic and sub-neolithic cultural groups' diffuse limitations (Meinander 1961: 15 f with op.cit.). In principle such an exchange between socially and culturally fairly similar groups might have been characterized by reciprocity (Moberg & Olsson 1973: 40 f). An exchange of more pronounced trade type between hunting groups among themselves with their own products are, as a rule, not motivated to assume other than possibly in pure exceptional cases - for example if a group had a local resource of an unusually suitable, but otherwise unavailable or unusual rock type (Baudou 1977: 44 f). The previously mentioned stray finds of S Scandinavian type may be distributed on a similar, successive way but they may also be imagined to be the result of a more direct connection with people coming from the S (Baudou 1977: 144).

A relationship with these objects may, namely, also be established to the sporadical cultivation, which is evidenced in the lower river valley at this time (above 6.2.2). This means a clear innovation which must be distributed from the S, since local prerequisites for the agrarian elements completely are lacking in the river valley. Ignoring the diffusion's character one may

point out that these agrarian elements were not accepted in such a high degree that they brought about a Neolithic culture of S Scandinavian character - for example of the Funnel Beaker or the Battle Axe cultures' type - within the area. Since the evidence of this cultivation at present lies solely within the natural scientific, ecological sources, its influence upon the, in archaeological meaning, cultural elements is impossible to observe. It may, therefore, be proposed that the sporadical cultivation was executed by people who still mainly were supported by hunting and trapping (Baudou 1974: 37 and 1977: 60). It is justified for this hunting culture with neolithic additions to use the term Sub-Neolithic in a meaning which somewhat deviates from Meinander's definition (1961: 4). On the contrary to the large Sub-Neolithical cultural groups in E Europe, Finland and S and middle Scandinavia this cultural variation lacks - at least until further (compare Baudou 1974: 36) - ceramics. The neolithic traits are then, at present, not of a technical but of an economical type, but the term's meaning of a cultural addition and a chronological parallel is the same (compare Meinander op.cit.). It is probable that certain social groups of hunting peoples may have continued prospering within the area without exploiting the new economical pattern and that these groups which had acquired the innovation may have used it irregularly. The addition has, as now may be judged, not been of such an importance that it was capable of, in any determining degree, influencing the earlier hunting culture's social system, for example concerning group size and mobility. It may probably have received the character of an extra resource, which was resorted to first when the normal sources of livelihood had given unsatisfactory exchange. Any effort to increase the nourishment supply above the immediate need has probably not arisen (compare Binford 1972: 435).

It is in the present research situation very difficult to comment with any certainty on the type of and methods for this non-systematical cultivation of a subsidiary livelihood character. It ought, however, with great probability - in the degree that it generally has had any regularity at all - to have had very long fallow periods and, therefore, almost constituted a type of primitive forest-fallow cultivation (Boserup 1973: 15, compare Wolf 1966: 20), whereby fire must be supposed to have been used for clearance. A highly extensive slash and burn agriculture with 1-2 years' cultivation of small pieces of land and perhaps some decades long, irregular fallow periods with following natural renewal of the forest (Wolf: 1966: 21 ff, Moberg & Olsson 1973: 26 f) may be an imaginable model. A temporary result ought then to have been a series of small, sparsely distributed lots in different stages of overgrowth, which may correspond to the partially opening grasslands which the pollen diagrams periodically evidence. These evidences are, however,

sporadical and difficult to interpret and one maintains somewhat antithetically on one side that "the evidence for Neolithic agriculture and stock-breeding found in N Swedish pollen diagrams is too imperfect for us to be able to say how the land was used" (Engelmark 1978: 45) and on the other that "it seems reasonable to conclude that quite large areas of forests of the coastal region here were affected by human influence as early as the Neolithic period" (Engelmark 1978 B: 9). Before any archaeological evidences of the kind of this cultivation are available, it seems that one ought to await more definite natural scientific attitudes to the question.

The reason for the neolithic establishment ought primarily to lie outside of the area. A within the local hunting culture expressed internal need of this economic addition ought, namely, also to have brought about a more expressed acceptance of the new economical signals. When this obviously is excluded that may be interpreted in such a way that real prerequisites for a "neolithication" of the hunting culture was lacking in this phase. The system had no other than occasional needs of the new elements (compare Clarke 1968: 414). The knowledge of these neolithic elements ought, therefore, to have been brought to the area by very small groups of "neolithized" immigrants - with the greatest probability from the S. It is not improbable that these groups may be connected with one, during this period, farther N established expansion of the Battle Axe culture's neolithic pattern, possibly in the form of smaller population additions (Malmer 1962: 515 f, 1975: 81, compare Baudou 1977: 140 and above 4.1.3 concerning a deposit find from Hässjö). The few immigrants ought - probably fairly soon - to have been assimilated by the previous hunting population. The hunting culture's economic and social systems have, after this acculturation, continued to live in mainly the same equilibrium and the neolithic elements have, instead of changing the system, become more of a resource in the effort to preserve this. A lasting result has, therefore, been that knowledge of the neolithic possibilities still survived within the system in order to be used at need.

The hunting culture's economical and social systems are, therefore, continually living in principle unchanged down into the Late Neolithic and Bronze Age. The technical changes, described above (6.2.3) and consisting of a new, completely surface-retouching striking technique in hard rock types and a very common point type in this design for all of Norrland, are interpreted as the most important indication of a cultural diffusion from the E during this period, above all to the inland but - secondarily? - also to the coastal area (Christiansson 1969: 22, Baudou 1974: 39 and 1977: 144). Points of this type are found in Finnish areas within the Kiukais culture and further E in

Europe as well as in Finnmarken and other Norwegian areas (Meinander 1954 B: 128 ff, Carpelan 1962: 5 ff and 1975: 36 f, Gjessing 1942: 183 ff). The datings are supported in the Swedish area through level relationships at the coastally connected dwelling sites in Västerbotten (Christiansson 1974: 32 f) and probably also in Ångermanland (Hvarfner 1957 B: 73 f with op.cit.) but the material of this type may appear rather pure also in the high mountain areas (Christiansson 1969: 17) and farther S (Lannerbro 1976: 72 f). To this and a partial later cultural diffusion from the E belongs also ceramics (compare Hallström 1929: 77 ff A and B) - partially textile decorated but above all asbestos tempered. Pottery of this kind is in the Ljungan Valley to date only known in the form of an unimportant stray find at Storsjön (Hvarfner 1962: 161), but this may be a coincidence and need not mean that the E elements should be markedly more weakly established here than farther N. The Swedish distribution of the asbestos ceramic with concentration in the first place to the river valleys nearest N of Ljungan and the Indalsälven (Meinander 1969: 60) may partly depend upon the intensity of investigation (compare Baudou 1977: 74, 83, and 86). These easterly elements are so distinctive and frequent that they ought to be interpreted as an immigration from E - NE to the inland (Baudou 1977: 145). The technique of working stone might, however, alternatively also be explained through the previously established, southwesterly courses of connection. Even a direct contrary direction of diffusion for this technique has, however, been suggested (Becker 1964: 129). One argument for a diffusion from the S by way of Norway has even been proposed by Becker, implying that the majority of flint knives of the late neolithic type in Middle Norrland and Trøndelag seems to be manufactured from Jutlandic flint (1958: 160).

During this period the Sub-Neolithic cultural form, judging from the pollen analytical sources, is continually sporadically recorded in the coastal area without needing to question new additions from outside, but such may to a limited extent have appeared. During the latest Bronze Age this cultural variety was spread, as above (6.2.3) was mentioned, also into the inland. The cause of this ought reasonably to be that the same need of temporary strengthening in the economical system was felt even here, that is to say, that the movable social groups have needed the exploitation of greater areas for this additional economy.

The cairn burial tradition at the coast is a marked innovation during this period, partially in the quality of Norrland's first known monumental burial tradition - that is to say, the first known ideal ancient monuments of importance - and partially because of their location in a previously non-

represented zone of the area. Both of these factors make their importance in the cultural-historical process difficult to analyze. The burial tradition is ideally - that is to say, according to the general interpretation of the external architectural and of the internal central grave's constructions - clearly tied to the contemporary S Scandinavian and Middle Swedish Bronze Age (Baudou 1968: 106 f, 1974: 38 and 1977: 123 f). This contact pattern has previously been considered to depend upon ideal diffusion (Baudou 1968: 108 and 1974: 38) but is nowadays interpreted as a consequence of a "proto-germanic" immigration to the Norrlandic coast (Baudou 1977: 145). From the viewpoint of traditional archaeology this ancient monument complex also meets several of the demands from a spatial, morphological and contential viewpoint and concerning mother and filial areas, which usually are proposed so that a hypothesis on immigration might be considered supported (for example Hole & Heizer 1965: 230, Malmer 1975: 117 f, Myhre & Myhre 1972: 46 ff with op.cit.). The explanation to the burial tradition's success might, however, also be one in large contemporary diffusion of the religion of the "S Scandinavian Bronze Age culture" both within the Middle Swedish and the Norrlandic areas, where an already established southerly additional population from the Neolithic times existed (Stenberger 1964: 307 f). Both interpretations collide, however, with the difficulty of the absence of functional remains in the immigration area which complicates the comparison with the accepted area of origin (compare 4.2.3 above). Those interpretations are, either, hardly possible to join with the hypothesis on the common cultural systems of the coast and the inland that above (5.2.2) has been presented.

The Early Iron Age is the period when the cultural pattern according to this model is most complicated both concerning internal development and innovations. It is also this period which is of decided importance for the understanding of the relationship between the hunting and the farming culture. The attempts at explanation may suitably be discussed zone by zone.

Within the highland zone the functional remains of the hunting culture are probably still used - that is to say, the Stone Age dwelling sites may still be presumed to be visited, even if the unequivocal archaeological evidence here is small (compare 6.2.4). An internal continuity is also evidenced in the natural scientific sources to the hunting culture's sub-neolithic variety, however, with one of the typical, temporary stagnations during the earliest Iron Age (Engelmark 1978: 46). A suggestion that this sub-neolithic culture in the inland should be of an agrarian sedentary type at the middle of the first millenium A.D. (Baudou 1978: 22) has as earlier (4.1.4) been mentioned not sufficient support in the natural scientific sources (Engelmark

1978 B: 11) and not either in the archaeological (Baudou 1978: 8 ff).

The graves of the highlands' lake shores may traditionally be interpreted as the result of a diffusion of ideal/religious character from the S within the frame of the hunting culture (Selinge 1976: 70, Ambrosiani unprinted) or as a result of that "small groups of people from the south broke into the purely hunter-fisher culture areas" (Baudou 1978: 20). Whichever one of these hypotheses one choses, a primary explanation must be sought in a cultural area farther S - for example the Mälar provinces or Värmland and SE Norway. It seems difficult that within these areas, which during the Early Iron Age to all appearances obviously had the possibilities of internal agrarian colonization (Ambrosiani 1964: 190 ff, Hagen 1967: 163 f), find reasons to an agrarian emigration to arbitrary located, scattered and unreachable places in Norrland's inland. An ideal diffusion may, on the contrary, be probable in that one has had possibilities of using a contact pattern, built out much earlier. The reason for that the burial tradition under these conditions was absorbed in the hunting society has been discussed thoroughly above (5.1.3). A relationship to the agrarian culture in the coastal land is in the earlier phase impossible or improbable both of chronological and morphological reasons. As an explanation to the later inland graves even for trapping, originating in the coastal land's sedentary culture, has been suggested (Baudou 1978: 22), in which case the graves should be included in the agrarian system's exploitation of the outlying lands.This aspect shall be discussed in the following model but it has been expressed above (4.1.4) that the morphological difference does not indicate such a connection.

The establishment of the sedentary, agrarian culture in the river valleys under the highest coastline means innovations within all the source groups. Within the ideal group appears as the most important and quantitatively most extensive innovation during the whole of the prehistoric period graves of a previously, in this area, unknown type and with a previously completely unknown location. These may traditionally be interpreted as the result of a colonization where "the colonizers primary purpose was to search cultivable soil as a base for the agrarian cultural form which they carried to the area" (JBV: 412). Functional remains of the same cultural system area found in the form of habitation site remains and traces of cultivation (JBV: 5.2.2 and 6.1.2). Natural scientific sources establish a cultivation with an environmental influence of a completely different strength than that of the subneolithic culture, and it appears also after a temporary stagnation in these evidences during the earliest Iron Age (Engelmark 1978: 46). "This would seem to indicate that the previously extensive and transmigratory economy became

replaced by a more sedentary type, with permanent settlements" (Engelmark 1978 B: 11). In this case, then, a completely new economical system appears and much indicates also large innovations in the social system. The source situation gives, therefore, greater reason than at any of the previous changes to accept an immigration as the most probable explanation. The existing system may then be said to operate as an open "recipient system" (Binford 1972: 439). If the change, then, does not only mean a modification of a system but the development of a wholely new, it may - with Rouse's terminology (1972: 230, 232) - have the character of ethnogenesis. The area of origin for such an immigration with a new ethnic background is, however, not possible to unambiguously point out. Most of the agrarian cultural elements seem to have clear connections towards the S, but even clear relationships towards the W exist quite as details without any clear area of origin (JBV: 280 ff). The real explanative problem is, therefore, with this interpretation pushed outside the area of investigation, and a factual explanation demands an analysis of the settlement development principally in the Mälar Valley and SW Norway, which would claim a comprehensive scrutiny of sources and literature. One may, then, say that the internal demands, which are needed in order to establish an innovation (Hole & Heizer 1965: 230), are satisfied in this case, on the other hand not the external.

One may, as an analogy, be reminded of the relationship at this time between the sources to the settlements in SW respectively N Norway, where a migration from S towards the N for a long while has been considered established (Sjøvold 1973: 255 ff with op.cit.). Myhre & Myhre (1972: 48) consider, however, after a discussion of the premisses that archaeological material, as a rule, only very modestly may throw light upon a migration. In spite of that Sjøvold's argumentation satisfies most of the traditional criteria (Myhre & Myhre 1972: 53), one considers with both internal and external motivations (op.cit. 60) that an immigration into N Norway is not supported.

In the coastal area during the earlier Iron Age graves were constructed with clear morphological and spatial - and so probably also chronological - connection to the preceeding period, although the representation during the earliest Iron Age is very sparse (JBV: 396 ff). The interpretational difficulties from the preceeding period still exist, but a connection to the agrarian system is probable according to the object finds. They may indicate a temporary exploitation of the coastal zone with a point of origin in the agrarian settlement, while ancient monument types and location speak for a continual relationship with the hunting culture (JBV: 396 ff). It ought to be mentioned that graves of cairn character even in other, ecologically

similar areas may be constructed during the Early Iron Age (Meinander 1946: 87).

During the Late Iron Age one continues in the highland zone to construct graves by the lake shores in the same way as earlier but probably in somewhat lesser extent. In exceptional cases these are of barrow character and may then be interpreted as the result of direct connections with the agrarian culture. Some barrows in the mountain valleys in quite another location may also derive from this period (compare 4.3.2 above). Reliably evidenced are also the natural scientific, sub-neolithic elements of approximately the same extent as before, and any extension is still not registered (Engelmark 1978: 46 and 1978 B: 11). A sub-neolithic economical pattern is, therefore, still applicable in this area, which is probably why also the dwelling sites carrying stone artefacts continually to a certain degree have been visited as bases in a mobile, extensive exploitation of the land (compare 6.2.4 above). A hypothesis that both fur trapping, iron production and agriculture with animal husbandry, with the latter as the main livelihood, should have constituted the base to the inland's economical system during the later Iron Age (Baudou 1978: 22) is not convincingly supported. Fur trapping may be included in the sub-neolithic pattern (compare the following model), iron production is known in this area only in the form of a type of constructions which derive from the historic times (Selinge 1970: 28 ff, Magnusson 1977: 11) and the agrarian elements have, as has been noticed, constantly the sub-neolithic character of extra resource,

In the lower river valleys and in the coastal land the agrarian culture's development continues with pronounced internal continuity, though a quantitative decline is clearly evidenced during the period's first half in the ideal source group's frequency (JBV: 246 f). Any further, external, ethnical addition is not evidenced though external relationships appear. These seem now dominantly to have a southerly direction (JBV: 303), which strongly is accentuated at the transition to the Middle Ages. An increase in the settlement trend during the period's latest part may have a connection with these relationships. A sporadical, functional exploitation of the coastal environment may still occur, though real evidence in this is lacking (JBV: 362). In large, the agrarian culture according to this model at this time may be expected to operate as a rather closed, self-supporting system - in any case up to the entering expansion phase towards the end.

Between the later Iron Age and the Middle Ages exists a pronounced continuity in the agrarian system's functional source groups since the locations of the

functional units, which now gradually are recorded in historical evidences of settlement, clearly correspond to the spatial archaeological indications. Continuity with a modestly expressed expansion occurs also in the natural scientific sources (Engelmark 1978: 47). In the ideal sources appear, on the other hand, a marked break and a very pronounced innovation, since the heathen burial tradition ceases with the introduction of Christianity as a total cultural diffusion from the S. One may discuss whether the change from a culture-systematical point of view in main lie on an organizational level or if it in the first place concerns the society's religious sub-system. That the official motivations completely lie within the latter field does not need to mean that the objective prerequisites also belong to this. That the change in religion, historically seen, has a strong connection with the current economical development in large and the emergence of a central governmental power is a generally accepted fact (for example Palme 1959: 156 f, compare Malmer 1962: 812). The question is who or what initiated the change in an area that was organized in farming units within smaller settled areas, which possibly had growing common organization, perhaps both for the settlement areas and the province as a whole (compare 5.3.3 above). The rune stones indicate that the shift in religion in the first place was introduced in the proportioned part of the agrarian clan society in the same way as on a larger scale is known in Uppland (Palme 1959: 144, compare JBV: 407 ff). Neither this nor the continual development indicate that the shift in religion should have any connection with an incipient social dissolution of the clan society (Palme 1959: 43 ff). The farmers' class may probably instead, more or less collectively, have been influenced by missionaries - either these stood only in the church's service or also had connections to a profane central power. It might further be probable that a collective introduction supported the organizational tendencies, not least through the religious memorial cult's relocation to central places for each settled area instead of a probable private custom of each farm. That applies, of course, no matter if the cult and burial tradition were the expressions of a more or less securalized tradition or for an actual religious need. How much of the AEgir cult that was living at this time is completely unknown, and much of the simpler popular cult, for instance for year's crops, could probably be saved over in new forms within the protection of the popular religion's under-vegetation. One is rather inclined to believe that the change was carried out on a higher level and relatively quickly and in this way had the greatest effect upon the agrarian system's organizational relationships, while the economical and social were influenced lesser and, in any case, more slowly.

During the early Middle Ages, thereafter, a distribution takes place of the agrarian culture within all three source groups along the river valley into the highlands. Historical records on permanent settlement also exist here already in the time of the earliest diplomas, as a rule in the 1300's. The Christian parish creation goes rapidly after the colonization (compare JBV: 409 f), and the paleobotanical sources evidence a marked expansion of cultivation, which reach maximal level in general during the early Middle Ages in Haverö (Engelmark 1978: 46 and 1978 B: 12). This means that the sedentary, agrarian culture, which has existed in the lower river valley since the early Iron Age, first now are established in the highland areas - with exception of the, according to the above, earlier colonized Lockne parish. This development ought to be interpreted as a colonization within these areas, originating in the earlier Iron Age settled areas, and any direct spatial continuity from the earlier, mobile, sub-neolithic cultural forms may not be traced. The reason ought, therefore, primarily to be a population pressure within these earlier settlement areas. The historical sources evidence a very extensive colonization in the upper Gimå Valley, located to the most cultivable locations and probably caused by a rapid population expansion in central Jämtland. In this area - but probably partially also in the main valley - enters, thereafter, a regression during the period's later part (compare 6.2.6 above), the reasons of which may be treated with historical methods (Dybdahl 1972: 75 ff).

6.3.2 An adaptive innovatory model

This model (Fig. 31) does not need to exhaustively be motivated in those parts which are rather similar with the previous one but main emphasis shall be laid upon an argumentation for the deviating parts. These may, according to the model's nature, be explained as cultural inventions, but carefulness invites the use of the more neutral term innovation even here. The character is, namely, in many cases not undisputable, and an adaptive viewpoint need not mean that internal new ideas are explained as conscious inventions. They may, equally well, be the result of more or less well thought out or occasional adaptations to the environment in the purpose of satisfying a need (Rouse 1972: 231). Main emphasis lies, then, in this model on the system's *adaptability* to shifting conditions while that in the preceeding model lay on their *receptivity* for influence. Purely visually, this difference is immediately seen in the models in that the one now treated is characterized by larger and longer continuity within each source system in the two main zones and of lesser defined and more unsure external influence. Such influences are completely deciding with absolute certainty only in three cases - one in

each source group - namely, the first immigration to the Stone Age dwelling sites, the first natural scientifically established neolithic elements and the first introduction of a surely non-locally developed ideal system, that is to say Christianity. For all other changes are different adjustments between internal and external explanations open in the causal reasoning. In the main question about the agrarian culture's development may, in this way be considered earlier unnoticed factors as "independent innovations", "operation of local selective pressures", "structurally similar ecological niches", among others, (Binford 1972: 444), which may be of importance for development of a local adaptive system.

For the Mesolithic times there is little to add or change in comparison with the former model since immigration into and exploitation of the area must have been introduced and taken place in large in the same way also according to this model. One may, however, to a certain extent question the more detailed hypotheses about immigration routes and mother cultures to the Norrlandic hunting culture. It is, for example, very possible that the working of quartz may have been developed within the Ljungan Valley with origin in the natural resources within the area - foremost within the Rätan area - without one having to assume a direct influence from the Suomusjärvi culture or its correspondences in more northerly Swedish areas. A typologically specialized and possibly more time-delimited artefact type as the keeled scraper may, on the other hand, be more difficult to explain as the result of an adaptive development, repeated and independent within different areas. A connection towards the SW seems, therefore, inevitable in order to explain the Mesolithic in the Ljungan Valley. Purely generally, one may, however, say that the N European Mesolithic cultural systems of this, in a larger context, relatively late stage must have a so long and complicated late paleolithic and mesolithic development in continental areas behind them that it must be difficult to recognize specified, spatially tied genetical reasons for the cultural forms within whichever area one may choose. The many common, as a rule rather unspecified, technological and typological elements within a very wide area may also have, to a great degree, a common base in the greater area's generally seen similar culture-ecological conditions. A part of the reasons for the mesolithic cultural system's established structural lack of stability and delimitation must lie in these contexts (Meinander 1961: 8). The Ljungan Valley is, in such a context, an unimportant pawn in a very large game, where the combination of the others may give a quantity of variations considering immigration routes and areas of origin for technical traditions and economical systems.

These principal evaluations must, to a great extent, be applicable also during the Early and Middle Neolithic times since the economical system does not undergo any more thorough changes. The only undisputable external innovation is the neolithic elements which carry a periodical and local establishment of a sub-neolithic cultural variety. For this establishment is the causal reasoning in the preceeding model also applicable in this. To the sub-neolithic variety probably belongs primarily a number of artefact types, which agree with the neolithic ones in more southerly parts of the country. These may, according to the preceeding model, be interpreted as the result of a diffusion, which in several cases are secured because of their material - that is to say, flint. One may, however, not exclude the possibility that they are so functionally tied to the neolithic pattern that they, in a number of cases, may have been developed locally as a result of the attempts to establish a neolithic economy. That they are spread also to the pure hunting culture's areas ought to be interpreted as one of the signs of a partial failure for the neolithic establishment and as evidence of the then following acculturation, which meant an assimilation of the neolithic cultural and ethnical elements.

Even in the highland zone certain innovations appear within the pure hunting culture's frame, which probably belong to this period. Among others, one learns to exploit new materials - probably through a successively increased knowledge about the environmental resources and because of continuing technical development and adaptation. Of these there are surely dark quartzites within the area as well as probably brecchia quartz. Slate in suitable or used fractions is sparse, but may appear. Without detailed investigations of natural appearance of the rock types, which are represented in the river valley's artefact types, it is very difficult to point out object types or artefact combinations of a traditional northerly kind, which might not have been developed through cultural adaptation during this period of more than 2 000 years but, consequently, have to presuppose cultural diffusion. In petrographically better known areas of the hunting culture a clear, locally conditioned adaptivity in stone technology has been evidenced (Lannerbro 1976: 39 ff). The relationships within for example Ångermanälven's river basin (Baudou 1977: 68 ff) and Ångermanland's coastal area (Baudou 1977: 39 ff) are so similar with those within the Ljungan Valley and Medelpad's coastal area in ecological and cultural aspects, that the result of the development within the hunting culture's system, accordingly, must be very similar whichever basis of explanation one will use. That, in today's situation, a considerably greater amount of material is known from the basin of Ångerman-

älven may be an occasional state of research and does not entitle a general acception about a diffusion of the northerly elements from the N towards the Ljungan Valley.

During the Late Neolithic and Bronze Age is, analogically, the continuity within the area still more pronounced within this model, probably involving increased utilization of hunting dwelling sites in the inland and in this way increased seasonal exploitation even of the coastal area (compare 6.2.3 above). The changed stone working technique, which according to the preceeding model could not be explained through a completely unambiguous external derivation, may, according to this model, instead be seen as an internal innovation, mainly tied to the inland but through the mobile cultural pattern probably also represented at the coast (compare Baudou 1974: 39). The reason for the technique's genesis may lie in the successive technical habituation to the possibilities of the new materials, since both the brecchia quartz and several quartzites ought to be more suitable for this technique than the quartz, which probably was dominating during earlier periods. It is in today's research situation difficult to, without new investigations, judge the quantitative factors behind the accepted derivation of the new point type, that is tied to the new technique, from Finnish and/or general easterly areas, since the earlier given distributions (Meinander 1954 B: 129 ff, Carpelan 1962: 15) must be obsolete and a satsifactory statistic over the very numerous Norrlandic occurrences is lacking. Purely empirically, however, these may be judged to be of the quantity that it is fully justified to pose a hypothesis of a completely native innovation. One must, probably, also include the possibility that the technique even here, as in the comb ceramic circles (Meinander 1954 B: 128 f), locally may go back to the Middle Neolithic. Two - or more - parallel innovations both E and W of the Bothnian Gulf are fully imaginable because of the, in large, very similar human ecological conditions both in economic and stone technological respects. One might also expect that the technique, at a distribution from comb ceramic areas ought to have brought with it more comb ceramic elements than the sporadical ones which now are known in Norrland (Christiansson 1969 B: 53 ff) - above all the comb ceramics itself. The distribution of the technique from this cultural circle may, however, possibly be later than the appearance within the same. Until a fundamental reworking has shown the opposite, in this case, however, the reasons for an internal innovation are to be considered at least as convincing as those for a diffusion (compare Renfrew 1973: 112).

As in the preceeding model the sub-neolithic cultural pattern is evidenced in the lower river valley's zone during the greater part of the period, and

a diffusion of these elements to the inland is evidenced latest in the late Bronze Age. The reason for this distribution ought to be a demand for the same resource reinforcement in the highland area. Within the mobile hunting culture has, then, probably greater lands been utilized for that additional way of livelihood also between those at present evidenced locations of investigations. The reason for this expansion ought to lie in the above (6.2.3) implied, increasing intensity in the area's exploitation, which is indicated by the dwelling sites with the new stone technique. A certain, although numerically probably unimportant, population increase may then lie behind this growing need of resources for livelihood (compare Boserup 1973: 9). The purpose of the increased acceptance of the sub-neolithic subsistence ought to have been to keep the system's equilibrium with the same mobility between the coast and the inland and approximately the same group structure as earlier.

Concerning the coastal cairn burial tradition during and after the early Bronze Age one may not either in this model exclude ideal ingredients, common with southerly Bronze Age environments. The principle judgements that above (5.1.3) were made concerning the highland area's lack of monumentally constructed and archaeologically verifiable graves before the Iron Age may, however, in principle also be applied to the coastal environment before the Bronze Age, since a seasonal mobility in the hunting culture's social model already earlier (above 5.1.2) is presupposed into these areas down from the inland. An absence of constructed permanent graves in the coastal area during the Stone Age - the grave at Lagmansören in Indal parish (above 5.1.3 with op.cit.) is still unique - need, then, not mean an absence of memorial or religious ideas within the same area. These may, namely, quite as in the inland, have been expressed in constructions of non-permanent execution. Under these suppositions need only the monumental forms but not the main contents to be new in the coastal cairn burial tradition of the Bronze Age. With this interpretation is the immigration from the S that was accepted in the previous model completely improbable. The new burial tradition may, then, be a result of a diffusion of the "S Scandinavian Bronze Age culture's"ideas from the S, which changed an more or less established burial tradition in a more monumental direction or perhaps, in certain cases, have had a completely new creative effect. Alternatively, one may imagine a relatively independent internal growth of the burial tradition on an adaptive basis, but the correspondence with more southerly parts of the country seems to be too detailed for this interpretation. The acceptance of certain chosen formal innovations and the new creation of others may be interpreted as evidence of a

receptivity for ideal influences within the hunting culture's system. This may, in turn, be interpreted as a sign of the culture's displaying an increased complexity or heterogenity (Binford 1972: 221 f) which in turn might have social reasons. It is possible that also these shall be seen in relationship to the changes in stone technology, in frequency of dwelling sites and probably in demographic relationships, which the development during the Late Neolithic-Bronze Age indicate. In the developed monumental burial tradition was obivously already from the beginning during the early Bronze Age included as an integrated, probably within this cultural area developed element (compare 4.2.3 above concerning Uppland), that the graves should be located at the sea's shoreline. This localization has probably been tied to a type of seasonally exploited, very temporary residences, which since the Stone Age occurred in this environment (compare 5.2.2 above). The localizations of both the ideal and the functional remains may be seen as an analogy to the corresponding ones in the inland.

The Early Iron Age becomes, of course, also in this model the most deciding phase for an enlightenment of the relationships between the cultural systems and for the understanding of their historical importance - not only for this period but for the whole following development. In the highland zone may, as in the preceeding model for strong probability reasons, be established an internal continuity in the Stone Age dwelling site's exploitation - probably both for the pure hunting culture and for the hunting culture's sub-neolithic variety. Not either in this model may any fundamental change in the latter pattern be established during the course of the Iron Age (compare above 4.1.4 and 5.1.3). As above (5.1.3) was more closely motivated the lake graves, which were initiated here during this period, may be interpreted as an internal innovation, where the forms for an already previously existing memorial or religious tradition are manifested in constructions with a previously unknown permanence. The earliest known graves are constructed during the pre-Roman Iron Age, which is why the remotest incentive to the innovation may be the ecological changes which then are verified (compare 4.1.1 above with op. cit.). More directly, it may concern the social dispositions which these changes may have given rise to in order to make possible a survival on a pure hunting basis. The changes may mean a certain stratification of the hunting society with burials of more prominent individuals, which may have had importance for example in an organizational respect in connection with the difficulties of adaptation. The changes ought to have taken place within the frame of a preserved or modestly influenced economical equilibrium of the pure hunting culture (compare below). Alternatively the burial tradition may

be the result of an idea diffusion within the valley in connection with the seasonal movements, by which the contemporary cairns and stone settings in the coastal locations have contributed to the initiation of grave constructions even in the inland (above 5.2.2). It is fully possible that this may have taken place in connection with a reorganization or widening to greater variation in seasonal residence, which may be conditioned by the environmental changes. In neither case does any direct ideal diffusion from cultural systems outside of the hunting culture need to be postulated. On the other hand, the latter variation required that space for the hunting culture's mobile pattern still was found within the river valley's lower parts (compare 5.3.2 above).

The great innovations in the lower river valley during the early Iron Age have, in the previous model, been characterized as the best evidence for a new immigration during the whole prehistoric period after the first mesolithic immigration. To explain these innovations by internal development may, therefore, seem to be difficult in this case (compare JBV: 399 and 403). Most evident are the possibilities for an internal development within the natural scientific sources, since the neolithic elements have been present for a long while, though they now receive a completely different strength in the pollen diagrams. The changes are here, however - though extensive - more a question of degree than of kind (Engelmark 1978: 46). The marked increase and stabilization on a high level of these elements presupposes, however, a not inconsiderable increase of the demographical foundation. That a similar took place is clearly illustrated by the above (5.3.2 and 5.1.2) made comparisons between the agrarian sedentary culture's and the mobile hunting culture's organization in basal units. This to a great part new economical system of livelihood, evidenced in the pollen diagrams, does not, therefore, in itself demand an immigration as an explanation if the basic social and demographical prerequisites for the new system may be explained in another way.

The ideal sources - that is to say, the new monumental burial tradition with dominant cremation layer constructions under often relatively considerable barrows (JBV: 233 and 227) - completely lack earlier correspondences within the valley and are located to areas where neither graves nor settlement previously is reliably known. In the same areas there are functional remains in the form of house foundation terraces and cultivation traces, which are difficult to date in the present situation but which with greatest probability are not earlier than the graves (JBV: 332 f). Both of these categories are then very clear innovations. In order to consider a simple,

linear immigration completely evidenced it is required, in principle, that an initial area, where all of the elements in the new cultural pattern are evidenced, may be pointed out (compare Malmer 1962: 807 f and 1975: 117 f, Myhre & Myhre 1972: 43 ff). As earlier was indicated (JBV: 280 f) is this, however, not the case with the agrarian culture's innovation during the Roman Iron Age. The artefact finds have a general Scandinavian quality with possibly contacts both towards the S and the W (JBV: 280 f). The burial construction tradition and the burial custom has, as a total memorial pattern, no exact correspondences. The former has closer correspondences in the W than in the S both concerning grave type (barrows) and the scattered distribution configuration. Concerning the latter, the cremation layer burial custom at this period has considerably higher frequency here than in any comparable area. In spite of parallels in different directions the burial tradition, therefore, has a pronounced regional character. "... the traditions - that is to say, cremation layer custom and barrow tradition - which became generally accepted in middle Sweden during the course of the Migration Period exist clearly developed and dominant in Medelpad already during its earliest Iron Age" (JBV: 235). The influence from the S which the grave quantitative and geographical conditions invite (JBV: 281) may, therefore, not have had the form of a pure immigration only from there. The possibility that "a population living here earlier should have accepted a farming culture and settled down within the most suitable areas for such a culture" (JBV: 281) is therefore, according to the prerequisites in this model, worth a serious test.

The sub-neolithic elements are - above all in Rudetjärn - early evidenced within the same area that later develops the sedentary agrarian culture (Engelmark 1978: 36 ff). Knowledge of the sediment soils' possibilities for permanent cultivation ought, then,to have existed or, in any case, to have had the opportunities to arise within the population, which carried the sub-neolithic cultural pattern, if or where a need of this had grown. This population has also been wandering within the agriculturally most suitable parts of the river valley, though the inland and coastal shore environments, judging from both dwelling sites and graves, were considerably more attractive as long as the sub-neolithic pattern only was an extra resource for strengthening of the hunting economy. The stimuli, which initiated the sub-neolithic additions to the hunting culture's system, were capable only of achieving negative feedbacks and a preserved equilibrium as long as the pressure was not sufficiently strong to reach the treshold effect to a system shift (Sherratt 1972: 481 ff). The requirements for such an effect with positive feedbacks ought, however, to have existed if such a pressure became sufficient-

ly strong. The question is, therefore, if sufficient, internal or regional pressure factors or cultural stimuli may be isolated in order to explain the economical system's new trajectory.

Such factors may, on the one hand, have meant deteriorated conditions for the hunting culture's sub-neolithic system so that this became insufficient for the maintenance of a rather constant population. On the other side, the factors may have involved that the existing economical and social systems had been changed so that the population had been growing and the support system hence became insufficient in spite of unchanged capacity. Theoretically and practically may also a co-operation of both of these factors have appeared. Under both conditions the change in order to solve the subsistence problem meant an increase of the production factor of work (Moberg & Olsson 1973: 22 f). Work has primarily achieved the increase or alternatively the maintenance of energy production, which was the basic demand of the pressure factors, and, therefore, also increased the extraction from the environment. The work has, in this way, also achieved the influence upon the environment that is evidenced in the pollen diagrams and, among others, also built up the constructions of which the preserved archaeological remains constitute a remnant. These constructions are, as mentioned above (3.2), effect variables of the system shift but function at the same time as steering variables for the study of this. Those in the real system steering variables are, on the other hand, the pressure factors aimed at here which have worked within and on the outgoing or changing system.

An, in the first place, imaginable such variable is changes in the human-ecological conditions - that is to say, in the area's habitat or biome or in both. The geographical/geological factors may hardly have been deteriorated - if anything one may say that the requirements for a system shift in this respect steadily improved because of the, through the land elevation, successively increasing availability of suitable sediment soils for cultivation. The climate deterioration in the Sub-Atlantic period around and after 500 B.C. has meant a lot of environmental changes, for instance a lowering of both winter and summer temperature, an increase of precipitation, the extinction of the precious deciduous trees, a decline of birch and alder forests, the entrance and relatively quick increase of spruce forest especially on the lower and more fertile soils, probably a certain soil deterioration through increasing podsol formation in the governing coniferous forests and a sinking of the treeline in the mountains (Engelmark 1978: 43 f and 1978 B: 4 f and 7, Lundqvist 1969: 191). One has earlier considered that this deterioration happened very quickly and was radical (Hellman 1946: 8 f with op.cit.), while

one today probably might prefer an interpretation implying a more successive development - in any case, judging from the recurrence surfaces of the bogs in the coastal areas (Lundqvist 1963: 95 ff). One has further maintained that even if one, from a botanical and plant geographical viewpoint, might have termed the development as catastrophic that did not need to be the case from a cultural-ecological viewpoint and above all not from the hunting culture's viewpoint (Hellman 1946: 10, Baudou 1977: 35). For this culture it may even instead have meant an advantage (Carpelan 1975: 31). Earlier hypotheses about almost complete depopulation of Norrland during the pre-Roman Iron Age (Hallström 1929: 74 f and 1942: 209 f) are, therefore, completely out-of-date (compare Baudou 1977: 144 f) and Hallström's presented first case of fallacy - that is to say, that the hunting culture lasted longer - obviously is applicable for this earlier research.

As mentioned above (6.2.4) the sub-neolithic elements are weakened or eventually temporarily disappeared during this period after a marked development during the latest Bronze Age (Engelmark 1978: 46). This may be interpreted as an indication of that the type of land use which they represent (compare above 6.3.1) has been made difficult because of the climate deterioration. Forest-fallow cultivation may, for example, have been obstructed by the increasing precipitation and the lowered average temperature, and the regeneration of secondary forest (Boserup 1973: 15) may have gone more quickly in this climate and with the entering spruce forests, which in turn may have made continued attempts of cultivation less evident in the pollen diagrams. Another consequence may have been that a sub-neolithic pastoral livelihood became more difficult partially because of the changing climatic conditions for animal husbandry and partially because of more rapid overgrowth of the grasslands. If the sub-neolithic marking in the latest Bronze Age accentuated the above mentioned probable tendencies to population increase during the Bronze Age - which seems reasonable - the new conditions may have brought along a marked pressure upon the sub-neolithic economical system both from the climatological and the demographic factors.

One possible response to these pressure factors may have involved a negative feedback, that is to say, a return to a pure hunting culture with a probably not unimportant, resulting population decrease. Above has Carpelan's understanding been touched upon that the change in climate rather may have meant an advantage for such a system, which, in such a case, must be required to have taken place through increasing natural animal production in the ecosystem. At the same time, however, the prerequisites have probably in other respects been worsened - for example for the collection of edible vegetables

and fruits of warmth loving types - which is why the total effect may have been neutral or negative even for a pure hunting system. The climate deterioration may then, totally seen, have brought about a pressure upon the economical and indirectly also upon the social system. This has become more susceptible in those parts of Norrland where the earlier tendencies to population increase during the Late Neolithic-Bronze Age were more marked. In these parts the crisis has, in time, not been able to solve only through a return to a pure hunting cultural system - in any case not without drastically decreased population - while this eventually may have been possible in lesser developed parts - for example in upper Norrland. After a transition period - corresponding to parts of the pre-Roman Iron Age - therefore, a successive system change takes place within the more developed parts of Norrland to which the Ljungan Valley belongs.

The change of the system may, then, according to this model be interpreted as depending upon both an ecological factor - that is to say, the deteriorated conditions for a sub-neolithic system - and a population factor - that is to say, an escalation of a pressure from a for a long time slowly increasing population. The system shift is paid with the increasing work contributions but is also rewarded relatively quickly with increasing possibilities of livelihood. In this interpretation is, then, Boserup's model with the populative factors as influencing variables and not as effect variables according to classic Malthusian theory (Boserup 1973: 9 ff., compare Welinder 1975: 57 ff) accepted in principle but not unconditioned.

The change consists, in the first place, in a transformation of the economic system which, however, quickly also gets social results. The most important fundamental change from a settlement historical viewpoint consists in that the earlier mobility is replaced by a pronounced sedentarism which is manifested in permanent settlement units for the functions home, work and livelihood (Wolf 1966: 13).These are localized originating in the demand of geologically and topographically suitable cultivation locations of the new agrarian main way of livelihood. From an agricultural technical viewpoint, this new way may mean a model with short periods of fallow or an agriculture with a yearly crop (Boserup 1973: 16) - that is to say, in other (Swedish) terms an agriculture with two or three-field systems (*tvåsäde* respectively *tresäde*) respectively one field system (*ensäde*) (compare JBV: 356). Both the settlemental and the technical innovations also bring along an increase of the socially and economically connected units' fixed capital, which may partially be invested in further production and partially gradually be changed into surplus or funds (Moberg & Olsson 1973: 23, Wolf 1966: 7 ff). This capital

influences in turn other parts of the system - the social, religious and organizational. In time, then, the system change brings along a development of a sedentary peasantry with fixed settlements in an organized society, with a combined subsistence economy of an agrarian/pastoral main type with the old hunting ways of support as subsidiaries, instead of a mobile group economy of cultivating hunters or hunting cultivators (compare Wolf 1966: 12 ff and Moberg & Olsson 1973: 81).

The archaeologically most noticeable effect variables of the system shift - that is to say, the graves - are in the quality of social and religious/memorial components in the system of secondary character in this development process, which is why this probably was introduced somewhat earlier than the earliest known grave datings (compare JBV: 242). The burial tradition may be interpreted as a result of the sedentary settlement situation, where both a social and judicial factor may have promoted a development of a monumental burial tradition. The former factor has a connection with the appearance of a proprietary family, clan or a corresponding institution within each settlement unit, and the other with the need to maintain the territory for this proprietorship through monumental constructions or in another way. The graves may, then, have a secondary function as symbolical inheritance documents, which may be seen still in the Medieval provincial laws (compare Ambrosiani 1964: 208). The sedentary innovation creates, therefore, conditions for a development away from the hunting culture's supposed egalitarian system and towards the exposition of a non-egalitarian one, which archaeologically is manifested in a selective burial tradition (JBV: 347 f, compare Kurth 1963: 39 f). The graves' morphological appearance may have been influenced by the supply of material and work within the settlement units, but it may also be accepted that external contacts of ideal nature - both from the W and the S - may have influenced the burial tradition both in large and in details. Such connections are, namely, reliably evidenced through the graves' inventory (JBV: 280 ff).

With those evidences of external relationships which then exist one may presume that even ideas to the system shift itself for a hastening of this may have come from the outside as a part in a successive economic exchange, but the basic prerequisites for the system shift is according to this model the result of an internal development. In the innovation's course itself also lies a stimulatively working mechanism: groups which continued to live within a sub-neolithic system may at their yearly passages through the lower river valleys have been stimulated by earlier colonizers' successful attempts with sedentary settlement to themselves establish such units within their own

coastally connected territories. The establishment may possibly also have been introduced successively through a marked condensation of fallow periods in a sub-neolithic system. If the present-day archaeological picture with the Tuna-Attmar settled area as the earliest unit (JBV: 242) is correct, one may for example imagine that other sub-neolithic groups by this colonization were stimulated to - successively or in one context - establish similar units within other coastal river valleys - for example in Selånger, Skön-Alnö and Njurunda. Contacts between agrarian colonizers and still existing sub-neolithic groups are, therefore, also both imaginable and probable already during the system shift. In certain cases, these may gradually have received the form of oppositions of competitive reasons - for example on the hunting grounds and fishing waters for the colonizers' subsidiary livelihood, when the established agrarian units became so numerous that the space in the outfields and the commons or at the fishing waters had become more limited for the hunters. Under the condition of a common ethnic and originally also economic background is, however, pieceful contacts of reciprocal character (Moberg & Olsson 1973: 40, Odner 1973: 73 f) quite fully imaginable between the two system's representatives. Spontaneously one comes in this context to think of the legends of such contents, which are recorded during historical times (JBV: 362 ff with op.cit.), without considering a connection from these earliest times to be proved.

The Iron Age agrarian system's functions are still unknown in details, but one ought to assume that they fundamentally did not differ from the models which previously have been constructed for earlier agrarian systems within comparable areas. In principle the system ought, then, to have been of "palotechnic ecotype" with "eurasian grain farming" (Wolf 1966: 30), even if this system's most typical qualities were not especially markedly designed in the beginning phase. A relevant model for the conversion of energy and other primary functions in such a system has been reproduced by Sherratt (1972: 498 Fig. 12.6). It ties in closely to what is known from Medelpad during the historical times, for example concerning the two-field system with fallow which was fertilized by pasturing, occurrence of work animals, forest grazing (in the model corresponding to heath), the care of meadows and a subsistence which is built upon an inseparable combination of vegetable and animal products (compare JBV: 352 ff with op.cit.). It ought, therefore, with certain reservations - foremost concerning the possible changes during the Late Iron Age (JBV: 355) - to be applicable already during the Early Iron Age's stabilized period after the system shift. Several of Welinder's simple and less complicated principle models (1975: 24 ff) are also naturally

applicable, not least his model of the cultural landscape (1975: 46) which is at least as relevant for a Norrlandic river valley as for the Mälar Valley. This dynamic sketch of the cultural development process in the area lacks, however, reason to handle the agrarian system's more statical functions in detail.

Lastly shall, therefore, instead the possible reasons for the development during the Early Iron Age's last phase be handled. Large barrows and "important men's graves" have previously (JBV: 365 ff) been interpreted as the result of a social differentiation of the settlement units with development of "trading farms" in the coastal areas (JBV: 371 f), whose economical background to a surplus production for export was considered to be based upon an exploitation of the hunting grounds. The term "trade" has in this context been used in an, at least for this area, traditional archaeological way without nearer definition, but it is too unprecise in order to explain the system's functions and change. The distributional forms may with Polanyi's concepts be divided into three main categories: reciprocity, redistribution and market economy (Moberg & Olsson 1973: 40 with op.cit.), which also may be divided into practical groups after motives and relations (op.cit: 45). As above (6.3.1, Early and Middle Neolithic) was hinted one may assume that the exchange, which took place within the hunting culture's system, to the greater part was characterized by reciprocal principles, these having either had the character of pure gift exchange or - probably only in exceptional cases - more resembled real trade exchange of a necessary character. The reciprocal principles seem, independent of the nature of the underlying social relations, also best agree with the probable egalitarian social pattern. As mentioned an exchange of similar character may be assumed to have continued between the agrarian culture and the hunting culture also after the system shift in the river valley.

On the other hand, it is possible that the forms for the agrarian culture's external relationships may have had or successively obtained a partially different character. The objects of a luxury nature, which already from earlier Roman Iron Age in a certain extent are placed in the graves, must to a great degree be imported (JBV: 253 ff, 280). They ought to a great extent to be explained as the result of an external, reciprocal exchange on a basis of friendship, kinship, status thinking or more political considerations within the relatively soon established proprietory farming class (Moberg & Olsson 1973: 47, Odner 1973: 73 f). Gift exchange seems to have a wide distribution in space and time within the Germanic area(Odner 1973: 141 ff). This exchange requires, however, reciprocal gifts or services which in main must have been

produced based upon the local qualifications. Already here may, therefore, a similar exchange in the native, socially seen probably lower level, with the hunting culture's still existing mobile groups have provided the possibilities of reciprocal achievements. Material to such ones may also have been produced through own, direct exploitation of the hunting grounds. One has, namely, very difficult to imagine reciprocal achievements on a corresponding "luxury level" as the import items of another character than the traditionally pointed out products of the hunting grounds - that is to say, in the first place furs of different types.

One has meant that the acquisition of the furs on a defined stage has characterized the whole cultural form within the greater part of the Eurasian coniferous belt, which should mean that the sub-neolithic, in main fishing and for internal needs hunting cultural groups under influence of a demand development from the S entered into a "post-neolithic" cultural phase. This was dominated by hunting and fur production for sale in the S - in the first place to the steppe peoples but depending upon the demand within classical areas (Vajda 1968: 282 ff). This deciding change is considered to have taken place within a time which corresponds to our Bronze Age and earlier Iron Age. Without pressing this analogy too much , one may, in any case, hold true that a corresponding demand increase ought to have been existing also in the areas S from the Norrlandic hunting grounds. A successive exchange system to the S and W from our area ought to have been two of the channels through which this demand was satisfied. One may, however, not ignore that the farmers of Medelpad may have been connected to their corresponding, opposite partners also through services and loyalties of a more abstract nature. The forms of far-reaching exchange both now and later during the Iron Age ought to have been of the type "local trade" - that is to say, the wares may have been moved between different "settled areas" which in a limited meaning simultaneously represented "market areas" (Stiernquist 1967: 29 f). It is natural to see, for example, the Mälar Valley, Gotland, Trøndelag or SW Norway as links in such a chain from Middle Norrland.

The Migration Period's central farms in the coastal areas (JBV: 367 f) ought to be a result of a further development along these lines. If these farms were settled by farmers who differed in material respects from their neighbours through greater means and greater resources (JBV: 372), these may probably be based in a proportionally greater influence on the utilized system of exchange. They may, then, have grown successively on a native basis under the influence of times of prosperity with resulting population increase and do not need to be direct manifestations of large-scale economical contexts

(compare Aberg 1953: 23). This ought, however, to mean that these farms were the central ones in a redistributive system, which probably may have functioned alongside the reciprocal patterns (compare Odner 1973: 75 f). Above all, they may have made up collection centers for products from a hinterland in the hunting grounds farther inwards, to which the hunters and trappers were connected in a system of loyalities. The products may have been forwarded to a further market through reciprocal exchange of gifts or redistributive contacts on a higher level. A market economy must not, therefore, need to be prerequired - at most the system may be considered as a tendency to administered trade (Moberg & Olsson 1973: 43 f, compare Odner 1973: 140 f). The primary economical exchange seems to a great extent to have remained within the central units themselves - in any case, if the grave finds and burial constructions are a representative measure of this - but may also have included a certain prosperity of the more normal farms (JBV: 371 f).

In this way, a further social differentiation of the society may have arisen. The proprietaries who controlled these few redistributive centers may have developed a tendency towards chieftainship with influence over both farmers and hunters in addition to, of course, over their own farm folk (compare Sahlins 1968: 20 ff). This may make an illustration to a proposed general theory "that competition for material resources is also a competition for authority" (Odner 1972: 646). It may not be definitely decided whether only one such chieftain farm was in operation simultaneously, but at least during the early Migration Period, may two have existed in Njurunda and Skön (JBV: 371). On the "normal" farms there has existed partially a proprietary family and partially also with great probability a small group of unpropertied people, "not worth burial" (JBV: 348), which were exploited in the farm's economical operation - possibly in a social status as slaves. Groups of mobile hunters in a very loose connection to the system may, further, have moved within the whole river valley but with "home base territories" in the inland, still uninfluenced by permanent settlement. Their social status in relationship to the farming society is impossible to certify, but it is not improbable that a certain differentiation already early may have appeared even among these, for which both the lake graves and the coastal graves may speak. A temporary, personal circulation between these hunting groups and the agrarian culture's lower groups is imaginable.

One may say that these groups economically primarily exploited different niches in the river valley - the hunting grounds, the arable lands and grazing lands respectively the administrative locations of trade - and that prerequisites for both co-operation and conflicts were present. Such a symbiosis

between the hunting and farming cultures may have appeared during different times and continued for a long time in suitable environments (Skjølsvold 1977: 263 f). A similarily constructed commercial system has also earlier been suggested for the area closest to the E of the Bothnian Gulf in this period (Meinander 1946: 95). Not least may the extensive residence with dominating hunting livelihood in the Norwegian coastal *"huler og hellere"* (caves and abris) during the Early Iron Age (Hagen 1967: 180 ff) be considered as an analogy to a surviving hunting culture in the sub-neolithic environment in the Norrlandic inland. The Norwegian hunting ground residence seems according to the latest interpretation to have the same character of yearly residence within an ecological niche in a redistributive system (Odner 1973: 150 ff), as is here suggested for the Iron Age's hunting environment in the interior of Norrland. On the other hand, may not the growth of a permanent exploitation of the hunting niche have a genetic connection with the stratification of the agrarian society as Odner suggests for his investigation area (1973: 155). This exploitation is instead a surviving, to a certain extent preserved earlier system, which now - possibly only partially - is exploited in a symbiosis with a new and more effective one. According to this model this co-operation is facilitated by a common ethnic background with an imaginable limited flexibility between the systems. The relationship may, then, be seen as an example of a cultural dualism, which has been suggested as a relevant interpretative model in Scandinavian prehistory (Hagen 1970: 153 ff). It ought to be mentioned that even another understanding is met here (for example Bakka 1973), according to which the hunting residence only should be temporary, outlying stations from the permanent habitations.

The topographically given division in "settled areas" within the farming culture'stotal area may probably have given opportunities to more co-operation between farms within these areas than between these larger units, but any organization for such a co-operation may not reliably be evidenced during the Iron Age (compare 5.3.3 above). Any development towards a political organization for the whole river valley or the province is not either possible to distinguish on this level, and a term as "the Norrlandic Migration Period's state" (Åberg 1953: 34) appears as a pure construction, not in the least against the background that the farming settled areas also in Hälsingland may have been organized into similar, smaller units (compare Baudou 1974 B: 35 ff). As was presented in another place (JBV: 410 f) is this, from a greater organizational viewpoint loose or undefinable relationship applicable for the whole Iron Age.

After this relatively extensive treatment of the cultural process during the early Iron Age, the later Iron Age may be treated somewhat more concisely. The agrarian culture continues, judging from all things, in the same way as previously - in any case within the social basic groups - and shows continuity within all three source groups. Any further expansion may, on the other hand, not be evidenced within this area - in any case, not before the period's quite latest part. An internal continuity within the hunting groups in the inland is with the above sketched model also probable. The concrete evidence for this is, however, lacking on the dwelling sites but exists - though probably to a decreasing extent - in the lake graves and continually in the natural scientific sources (compare 6.2.5). The period is, therefore, dominated more by continuity than by change and the systems may still - however probably with the exception of the earlier highest social level - have continued to live in the way sketched above.

A complication, however, is recorded in the earlier treated decline in the number of datable graves during the Vendel Period (JBV: 242 f), which with greatest probability also is joined to the ceasing in construction of large barrows and graves with richer goods (JBV: 373 f). Of the possible interpretations, which may be made of this research situation, a hypothesis on a settlement historical cause seems most probable (JBV: 246 ff), not least against the background of parallel lines of development within other Scandinavian areas (JBV: 415 f). Against the background of the above given economical explanation of the socially marked grave and find complexes of the Migration Period a comment to earlier accepted hypotheses for explanation of the poverty of finds during the Vendel Period is necessary. These were, as is understood, based upon an idea that the differences in find frequency between the Migration Period and the Vendel Period in Norrland was depending upon a reorganization of the N European and continental trade routes during the Merovingian Period (Åberg 1953: 154 f, Biörnstad 1962 B: 128 ff), with which an increasing E Swedish influence in Norway and Norrland during the Vendel Period and Viking Age was considered to be connected (Biörnstad 1962 B: 131 ff with op.cit.). Such connections are, however, today richly evidenced already during the Migration Period (Holmqvist 1972: 255, Lundström 1976: 33 ff, compare Baudou 1977 B: 22). On the other hand, the absence of a socially more marked ancient monument and find complex during the Vendel Period might well seem to be allied with Åberg's hypothesis. Even if the decline in the grave frequency in general might have settlement historical reasons (compare JBV: 415 f), the absence of the higher social complex might depend upon a break in Åberg's accepted large-scale commercial relationships (the

so-called "North Sea bloc"). The question must, therefore, be connected to the probability of a general occurrence of such relations on the whole within the N European area in the Migration Period.

Åberg's hypothesis builds in large upon qualitative and subjective, to a great extent stylistic and intuitive evaluations of find complexes within a wide area, without a closer analysis of the underlying economic-historical factors. Even if the find evaluations with his solid empirical background, in large, should be correct, the conclusions are drawn without any appreciable attempts to tests of their validity. It is, for example, clear that Åberg (1953: 29 f, 1956: 209 f) took it for granted that the find distribution was the result of a trade on a market basis with profit as the motive (Moberg & Olsson 1973: 45), even if he did not discuss trade principles but understood them as involved in the find distribution. The continental economic-historical relationships between the fall of the Roman Empire and the Carolingian Period - that is to say, during the Migration and the Merovingian Period - have been the object for many extensive economic-historical investigations, where names as Dopsch and Pirenne long have been fundamental. It should be going too far to review these in this context, but they have left partially conflicting results both concerning the nature and the time of the economical transition from classical antiquity to the Medieval feudalism. Odner (1973: 118 f) interprets the discussion so - according to the N European conditions - that one may hardly assume a market economy of greater extent during the Merovingian Period within the Continent's N parts and that, in any case, the exchange with Scandinavia - that is to say, in the Migration Period must clearly with SW Norway - probably has been carried on as a status trade on a mainly reciprocal basis (compare Sahlins 1968: 9), but that redistributive tendencies with connections to an administrative trade may appear (Odner 1973: 139 ff). It is circumstantially given or in any case highly probable that the pattern was the same also for trade with Sweden - among others for the exchange between Norway and Medelpad in the Migration Period. It is, consequently, improbable that the exchange took place after other principles in the Vendel Period with its obviously lesser extent of trade in Norrland.

Under these circumstances no conditions seem to exist for the supposed commercial large-scale system (that is to say, Åberg's "North Sea bloc") and in this way not either for a break or a marked reorganization of such a one. Above all may even an accepted such development not explain the lack of social markings in finds and ancient monuments during the late Iron Age in Medelpad with its presupposed settlement continuity. One of the deciding faults with Åbergs hypothesis is, therefore, that it has not been brought

into connection with its social implications. If the Migration Period's tendencies to a chieftainship had remained, they ought to have left their archaeological expressions also during the Vendel Period - for example of a similar kind as within the Upplandic aristocracy. In this model one must, therefore, hold true that the absence of such markings shall be set in connection with the declining frequency of the Vendel Period grave finds in general and that it depends upon the same conditions in the area's settlement development. The most probable reason for the variations in grave frequency is, as already is shown, a temporary regression in settlement. This ought, then, also to have resulted in that the foundation for the socially marked aristocracy with "trading farms" and tendencies to a chieftainship failed. If the chief's farms survived the regression it has, therefore, probably been only in the form of normal farms. It is not excluded that an obvious secondary name as Högom may imply even a temporary abandonment of a chief's farm.

The above (6.2.5) mentioned fluctuation in the vegetation curve for the cultural landscape constitutes a strong support for the interpretation that the decline in grave frequency depends upon a settlement regression (Engelmark 1978: 37). This interpretation may also be set into a repeated pattern in many areas for agrarian Iron Age settlement (JBV: 415 f, compare also Meinander 1946: 99 f). A relatively primitive way of cultivation - for example in the form of a repeated one field system on small permanent field areas (compare JBV: 356) - may have brought about an impoverishment of arable lands, especially if regular manuring of these did not occur. At the same time, the powerful expansion during the nearest preceeding period may have resulted in that certain areas were already nearly completely colonized, which is why the system lacked sufficient flexibility in order to control a situation of decline. A causal relation ought, according to this interpretation, to exist between colonization, time period of exploitation, way of cultivation, agricultural crisis and regression (compare Welinder 1975: 32 and Rønneseth 1974: 188 f). The reason for the Vendel Period regression in Medelpad is at present because of lacking investigations, impossible to analyse in detail but they ought, in any case, to lie within their own settlement area. As mentioned above (6.2.6) the Medieval development in Middle Norrland may be seen as an analogy to that of the Iron Age, and a cyclical course may be normal for a relatively primitive agrarian culture. That the development towards a socially more differentiated society was broken off in Medelpad during the Vendel Period may then, most simply expressed, depend upon that the foundation for the differentiation had disappeared. This ought,

then, to have meant that the development towards a redistributive economy was temporarily broken off. It is, of course, not completely excluded beforehand that this may have had any connection with, for example, Uppland's development during the Vendel Period, but it is impossible to motivate an internal change in the river valley's cultural system, which both implies a settlement regression and a break in the social development only with a wholely or partly changed direction of the external connections.

During the Viking Age a renewed settlement expansion begins gradually, which, however, seems less marked in this river valley than in several other areas in Norrland (JBV: 248 and 416, Selinge 1976: 47 ff). Within the frame for this renewed expansion apparently no similar tendencies to social differentiation are developed as during the Migration Period, but the graves have in large en egalitarian character. Even if certain grave inventories - especially in the later Viking Age - speak for a marked renewal of the external relationships (JBV: 298 ff) - a corresponding marking in the grave monuments is now lacking - on the contrary to what may be the case in other Scandinavian areas (JBV: 374 f). This renewed expansion builds, in any case within Medelpad, completely upon a native basis, which among others ought to mean a revival for the agrarian ways of livelihood and probably a recultivation of previously temporarily abandoned units. One may not exclude that this expansion may have a connection with a development of the agricultural technical methods (compare JBV: 326 f and 355), which might mean a more intensive cultivation with regular manuring (compare for example Welinder 1975: 84 and Rønneseth 1974: 48 ff concerning manuring during the Iron Age). A parallel with a development observed in Norway should, in any case, be imaginable (Myhre 1972: 182 ff and 1974: 73 ff, Rønneseth 1974: 104). The exchange with other areas may, within this river valley, not reliably be evidenced as having another character than previously, that is to say with reciprocal exchange as the probable main pattern.

Within other areas of Norrland - above all Ångermanland and Jämtland - there are, however, tendencies to a commercial development, which ought to have redistributive elements with a marked exploitation of the hunting grounds as an important base of an exchange with far-reaching contacts (Hvarfner 1957: 78, Biörnstad 1965: 77 ff, Baudou 1977: 103, Selinge 1967: 70). This economical system may, however not, as during Medelpad's Migration Period, be associated with tendencies towards local chieftainship or a corresponding social differentiation. It has, surely, instead a relationship with the Viking Age's general Scandinavian development within production and distribution, where the production in series of a previously unknown quantity and a markedly

redistributive, administrated trade seems to imply at least tendencies towards a market economy (Stenberger 1964: 773 ff, Almgren 1966: 164 ff, Moberg & Olsson 1973: 100). This development may probably have a connection with a beginning extension of the influence of a growing central power even over the Norrlandic areas. In such a process the prerequirements for development of local chieftainships are lacking, even if prominent representatives for an independent farming class may have reached both prosperity and wealth. One may quite simply assume that Medelpad is drawn into this development even if the archaeological evidence is less clear here than in bordering provinces. The rune stones (compare 6.3.1 above) and the treasure finds (JBV: 381 f) are among others, evidence to this.

The following Middle Ages have in the above been briefly described both concerning settlement development (6.2.6) and with consideration to the shift in the ideal sources (6.3.1). Here is rather more a question of the reason for this development according to this model. Christianity's probably relatively quick success indicates that a receptivity for change existed in the Viking Age society, which may not readily have any other background than the renewed economical expansion with lively external connections (compare Selinge 1976: 72 and JBV: 406 ff). The marked spread of the permanent settlement of the agrarian culture into the highland areas with origins on both the lower river valley's settled areas and in the Storsjö basin of Jämtland must mean that the old hunting culture's economic system at the latest during this period must have definitely been broken. Still existing hunters may, in this way, probably have become colonizers within their own previous "home base territory". The exploitation of the hunting grounds received, in this way, the definite form of outlying ways of livelihood for the agrarian culture. The system for this exploitation may, then, more or less directly be originated in the hunting culture's extensive pattern (compare 5.3.2 above). It is probable that certain methods for hunting and fishing in connection with this definitely have been taken over by the farmers, which is visible above all concerning the trapping pits. This development has, however, probably been introduced already during the later Iron Age - above all in Jämtland (compare Selinge 1976: 70 f) - even if no reliable evidence of this still is recorded within the Ljungan Valley. Such cultural loans also find the most unsought explanation, if an ethnic connection and a continual development according to this model may be assumed between the hunting and farming culture.

The intensity of colonization is at complete colonization a function of the environment's ability to support sedentary, agrarian settlement but still during the late Middle Ages the colonization course's chorology might to a

certain extent dominate the picture - above all in the upper part of the main river valley. For both there and within the E part of the Gimån Valley a certain colonization appears later (Rudberg 1957: 132 ff, Nordberg 1977: 19 ff), likewise there is later a Finnish colonization - partially during other ecological conditions - within certain woodlands (Gothe 1942: 60 ff, Nordberg 1977: 13 ff). These marginally located, late and small hamlets are now often being abandoned again. In large, however, the Medieval sparse settlement picture within these parts of the river valley (Fig. 27) is applicable for the future, which must be interpreted as a strong evidence of the highland area's modest attractiveness for a permanent settlement of this character and as evidence of the settlement's great need of outfields in these locations in order to reach a satisfactory support (compare Rudberg 1957: 121 ff and Nordberg 1977: 16 f). This need of outfields one has partly been obliged to maintain against the governmental authorities' fiscal interest of further colonization. From a geographical point of view one has come to the conclusion that Norrland in large, in spite of the unequal settlement distribution from an agrarian viewpoint has been fully colonized during Modern times (Rudberg 1957: 164). Even the mentioned late Medieval marked regression in the Revsund area with desertion of farms, which to a great degree never was recolonized, evidence the same fact (above 6.2.6). The hunting culture's dense spread of dwelling sites within the same inland areas is a striking contrast to this (above 4.1.2) and a good illustration of the two cultural systems' different ecological prerequisites. These relationships underline further that the highland hardly has been attractive for an agrarian colonization before the total colonization of the lower river valley, and it is even because of this reason, therefore, highly unlikely that the lake graves is an expression for such a one (compare above 4.1.4 and 5.1.3). The concluding distributional picture of the agrarian settlement within the valley is a product of both the environment's characteristics as an ecological basis and of the historical process.

During the Middle Ages also - in spite of a still mainly prevailing self-subsistence system - a more stable connection to the central systems for a market economy and the political administration of power successively appears. A concluding expression for this are the above (6.2.6) used fiscal sources from the 1500's, which simultaneously compose the final product of the Medieval fiscal development and the introduction to a new era (compare Jonsson 1971: 49 f). Another expression for the central tendencies is the influence on property ownership and outfield's exploitation - above all stream fisheries - that the religous organization with international back-

ground obtains during the Middle Ages. A third expression for the same tendency is the spatial organizations in,above all, a judicial purpose which possibly may have existed already earlier but first now is reliably evidenced (compare 5.3.3 above).

Characteristic for all of these societal organizations is that they in large only may be evidenced in historical sources while the archaeological ones, as above (5.3.3) is seen, are extremely difficult to interpret in these respects. One may, therefore, in closing point out that the shift between solely archaeological and predominantly historical sources makes a dating of important elements in the society's development especially difficult to master. It is, in other words, difficult to determine if the deciding differences, which in these respects seem to exist between the Iron Age and the Middle Ages, in all parts have a real background, or if they partially are caused by differing interpretational possibilities between archaeological and historical sources. A deciding development may also lie within the two centuries - the 1100's and 1200's - which to a great extent are lacking both kinds of sources but may have been of fundamental importance for settlement development.

6.3.3 The ethnic problem

In this work the main emphasis has been laid on an investigation of the cultural systems, their ecological prerequisites in the landscape and their exploitation of these. On the other hand, yet no notice has been given to the question of the ethnical identity of the people and groups of people who carried these systems. From the principle points of origin, chosen here, this question is also of a distinct second-hand interest, since the systems' function and the cultural process in principle are not directly depending upon this factor. On the other hand, the question of co-operation between the systems and the cultural process's continuity may have a connection with the cultural carriers' ethnical identity - above all as background to the known ethnical relationships in historical times. A choice between the two models for the cultural historical process, discussed in the preceeding chapter - or an evaluation between the different variables within these - must, therefore, also take place with certain respect to their ability to explain not only the cultural historical but also the ethnical picture, which in the historical period's conditions composes the finished product of the prehistorical development. A limited discussion of these questions is, therefore, inevitable.

In earlier research on Norrland's prehistory and early history this question

has - above all within earlier schools of research - had high priority and an extensive literature is available within different professions. It may here not be a question of exhaustively reviewing this or taking an attitude to the different standpoints, which with more or less realistic points of origin have been taken towards the question of the ethnogenesis of the present-day Norrlandic folk and language groups. In my opinion one has often taken decided standpoints in the question without sufficient consideration to all the relevant factors, which may have lead - or been exploited - to hastened conclusions also in the current questions. A continued discussion should, therefore, be promoted partially by emphasizing to a higher degree the anthropo-centric common, which lies in the Norrland landscape's human-ecological prerequisites and which must have influenced the cultural systems independent of their ethnic background, and partially by greater respect for the question's complexity - even with the risk that this may lead to the insight that no conclusive solutions are to be won.

In too high a degree the ethnical problem has been tied to the question of the identification of the Lapps with archaeologically or in other ways identified groupings in the cultural historical material. In the first research generation, which treated these questions, the Lapps, as a rule, were identified with the carriers of the "arctic" Stone Age with, above all, slate objects (for example Montelius 1876 and 1906: 63). According to a later general interpretation - above all represented by G. Hallström - the Lapps may instead have immigrated at a later stage - usually specified to the first millenium B.C. (Hallström 1929: 81 ff). The earlier Norrlandic and Lapplandic Stone Age material ought, on the other hand, "to be seen as a direct offshoot of the south and middle Swedish Stone Age and that no other race or races than these which lived in southern or middle Sweden ought to be imagined to have lived in Norrland and Lappland" (Hallström 1929: 56). During the later decades an identification with the early Stone Age material has again been discussed, partially in the form of a today out-of-date connection to the hypotheses of the 1930's on the origin of the Komsa culture (Wiklund 1947: 6 ff), partially with reference to the presumed course of deglaciation (Manker 1951: 227 ff) and partially in connection to the collected material of the lake regulation investigations (Manker 1963: 37, Christiansson 1969 C: 33 ff, Westerlund 1969: 239). Hellman (1946: 28) has early formulated a careful conclusion in this direction through declaring that no archaeological reasons speak against the hypothesis that "the quartzite people" should have been Lapps. With an unbiassed point of origin it, therefore, in today's situation seems to be quite equally justified to turn Hallström's

(1929) classical question around and pose the problem: Is it possible to fix the Scandinavians' immigration time into Norrland? With this neutral ethnical term in this way is comprehended the ethnical elements, which both from a linguistic and a physical-anthropological viewpoint may have been the origin of the present-day non-Lappish population of Norrland.

One may, however, question if not both of these points are posed in such a topically immediate way from an ethnical viewpoint that the archaeological material has great difficulties of answering them. Hagen (1970: 136 ff) has pointed out several of the difficulties which are inherent in a connection of an applicable term "people", that is pertinent for the groups of men themselves from a linguistic, emotional and organizational viewpoint, with the archaeological material (compare also Baudou 1977: 142 f). It is not difficult to find evidence of diffuse improbabilities at this point in earlier archaeological reasonings (for instance Hallström 1929: 75 ff). It is possibly fundamentally more correct but probably not unconditionally applicable to assume such a connection on a physical-anthropological basis (compare Beckman 1964: 42 concerning the heterogeneity of the Lapps). To use a term like *the* Lappish(*samiska*) culture (Baudou 1974: 30) at an attempt to a definition of historically explanative questions means, therefore, also a too simplified up-to-dateness which, in any case, may be misunderstood and misused. In a wide meaning one may speak about at least three economical/social earlier cultural systems in Norrland - in addition to the two treated in this work also reindeer nomadism - and about at least two "peoples" - the Lapps and the Scandinavians. The only imaginable connection between these concepts, which at an historical treatment a priori may be excluded, is that between Scandinavians and reindeer nomadism, while the Lapps or "proto-Lapps" may have been engaged in all of the cultural systems. Theoretical possibilities exist then, with ethnical definitions, for at least three "Lappish (*samiska*) cultures", two of which may at the same time be "Scandinavian". In the extension of this argument lies that one may hardly in an unconditioned way study the "Lapps' (*samernas*) prehistory" (Baudou 1974: 33) quite as little as this of the "Swedes" or the "Scandinavians" from an ethnocentrical viewpoint, while it is, on the other hand, relevant to study the prehistory of for example Lapland, Sweden, Scandinavia, the Arctic area of the Scandinavian countries or any other area from an anthropocentrical viewpoint (compare Moberg 1969: 204). With these principle objections in mind, it may, however, be justified to try and take an attitude to how the prevailing ethnical interpretations may be included in the alternative development processes, which were sketched in the preceeding section.

Up-to-date, short reviews of the research situation from an archaeological viewpoint has been given by Christiansson (1969 C) and Baudou (1974). Christiansson takes, as mentioned, directed by this review an attitude for the hypothesis, that the Lapps are the native inhabitants of Norrland - however with modification through conditioned later additions (1969 C: 33 ff). Baudou's review leads instead to the conclusion *"that the Lapps' (samernas) ancestors immigrated to Norrland during the period 1 800 - 500 B.C."* (1974: 43, italics his). Later he has widened this hypothesis to include a successive spread of both "proto-Germanians" and "proto-Lapps" (*protosamer*) in Norrland during the period 2 000 - the Birth of Christ (1977: 145), while for the earlier Stone Age present-day ethnical concepts are considered to lack all relevance (1977: 143).

The ethnologist Lazlo Vajda has further in an extensive work of the Eurasian nomadic culture's history given an exhaustive review of the arguments for the Lapps' early history, originating partially from hunting the wild reindeer (1968: 189 ff) and partially from reindeer breeding (1968: 419 ff). He considers that there does not exist any original connection between the Arctic Stone Age and the Lapps but that the Lapps assimilated elements from the earlier cultural forms after their immigration (1968: 192). He seems further to mainly accept the theory that the philologists (compare Collinder 1953: 56 f) developed under influence from physical anthropology, that a population with a hypothetical "proto-Lappish" language on a certain cultural level has gone over to a Finno-Ugrian tongue (1968: 420 ff). He also maintains that the area, where a Lappish population first may be identified, is located between Lake Ladoga and the White Sea (compare Collinder 1953: 12) -partially with support of a seemingly unstable argument on the Lappish loanwords for sea mammals (1968: 427). From there they shall have immigrated into N Scandinavia, where they are established at the Varanger *fjord* during the early Iron Age in an environment with strong Stone Age traditions (compare Gjessing 1942: 365 f, 1954: 6 and 1955: 90 f, Simonsen 1967: 66 f, Kleppe 1977: 37 ff), and have, thereafter, spread to the S parts of the present-day Lappish area first in historical times (Vajda 1968: 428). The Lapps' then evidenced "Wanderungsgeschichte" is explained as a result of a pressure from stronger competitors' side in the fight for a commercially initiated and executed fur hunting (Vajda 1968: 432 f). The explanation is obviously conditioned by the work's greatly designed main theory of a "phaseological" development in a diffusionistic and migrational pattern within the whole of the Euroasian *stepp-tajga-tundra* area (Vajda 1968: 281 ff, 321 ff with others), by which the organization of the fur hunting was given a decisive part.

One must then at accepting an attitude in these questions pay respect to the research results from at least three professions: historical philology, physical anthropology and archaeology and in certain cases also ethnology, which makes the research area difficult to review. It seems to me as if the archaeologists - in any case, the Swedish ones - respected the philological complications too little, especially as the generally utilized terms Lapps/ *samer* basically are linguistic. On the other side, of explainable reasons Vajda's archaeological insights ought, for example, not to be completely up-to-date. The physical anthropological arguments have, otherwise, in general been appreciated though even these are difficult to interpret. Even here may the currentness be difficult to watch - for archaeologists for example.

Concerning the classical physical characteristics (Collinder 1953: 71 f with op.cit.., Beckman 1964: 36 f) the Lapps seem, as a rule, clearly to differ from the Scandinavian population, but in certain cases - above all concerning the cephalic index - the differences between different Lappish populations mutually are equally large as between a part of these and the Lapland-Swedes. Concerning blood group frequencies (Beckman 1964: 38 f) there exist in certain cases significant differences between Swedes and Lapps, while in several other cases the mutual differences are greater between Swedish and Norwegian Lapps. In single cases, there exist tendencies towards frequencies of the Asiatic type but these are never dominating. When considering blood serum groups (Beckman 1964: 40 ff) there are in most cases deviations between Scandinavians and Lapps, which may be interpreted as an Asiatic influence within the latter population. The split picture does not speak for an origin in any decided direction (Beckman 1964: 43 f), rather for an origin in an internal small group, which may have been changed both through random variation and through influence from both Scandinavian and easterly groups. A later investigation of "red cell enzyme polymorphism" (Beckman et al. 1971) has in some cases been able to explain deviations between Lapps and Scandinavians as climatically conditioned, while this is not applicable in other respects. In certain cases there are greater differences between Lappish populations mutually than between these and Scandinavian ones, and again in another respect deviations which are common to these and Finnish populations. The Lapps have, therefore, a unique genetic composition which probably to a great degree may be explained through "founder effect and genetic drift" (Beckman et al. 1971: 247). An eventual origin from other directions is, therefore, not evidenced, not either is it possible to judge whether ecological factors have had any deciding adaptive influence.

Linguistically the Lappish have a relatively independent position within the Volga-Finnish group of the Finno-Ugrian languages which is separated from the Eastern Finnish, from which, however, Lappish has been secondarily influenced (Vajda 1968: Tafel 14: 1-2 after Hajdu, Collinder 1953: 53 ff). If, however, the above mentioned hypothesis of a linguistic change from a "proto-Lappish" language to the present within one and the same ethnic/anthropological group is correct (compare Wiklund 1947: 3), the present language may hardly in a deciding way contribute to a solution of the question of this group's genesis, even if it has been assumed that relics of this supposed ancient language may still be existing in the present-day Lappish - perhaps towards about one-third of the vocabulary? (Vajda 1968: 425 f with op.cit., Wiklund 1947: 9). In addition, there have appeared numerous loans - both in primary and secondary lines - from both the ancient Scandinavian (Collinder 1953: 62 ff, Dahlstedt 1965: 138 f) and Finnish and Slavonic languages (Vajda 1968: 424 ff), which must make a definition of origin more difficult (compare Collinder 1953: 56). As the supposed migration and distribution course is presented (Vajda 1968: for exampel 429 and 432) with remaining groups, assimilations, repeated "waves", linguistic "reimpressions" etc. it leaves, moreover, all the possibilities of interpretation open. As well as I, without professional linguistic knowledge, may judge, therefore, Vajda's pessimistic statement (1968: 430) on the possibility for an archaeological origin identification for the Lapps must also apply to the possibility for a linguistic one: "Bei der Komplexität dieser Abläufe und bei der Dürftigkeit unserer Tatsachenkenntnisse erscheint es praktisch aussichtslos, die Protolappen archäologisch bestimmen oder genau lokalisieren zu wollen".

An attempt has recently been made to concisely and schematically correlate N Finnish archaeological data with philological and physical anthropological results (Carpelan 1975: 38 ff). One considers here that the original mesolithic immigration in Finland has had a middle European element of "Europid" racial character and an easterly-Ural element of probable "Mongoloid" character, of which the latter contributed the then mixed population with a Finno-Ugrian language. After a continual development a division of the population took place in the late Comb Ceramic period towards 2 000 B.C., at which from a population with an "ancient Finnish" language was developed, among others, a northerly group with "prehistoric-Lappish (*fornsamisk*) culture and an "ancient Lappish" language. This groups has in the Finnish area continuity up to "the historically identifiable *same* culture". In N Fennoscandia, otherwise, an earliest population might have existed, which was composed of the middle European population stream through Finland and

one or two groups which was come by way of Scandinavia. "During the last part of the second millenium B.C." one further immigration came from the E, after which the "prehistoric Lappish" cultural group achieved a "lappishing" of the whole N Fennoscandia during the early metal period (compare also Wiklund 1947: 24). This sketch then joins knowledge of the paleo-anthropological characteristics in the present Lappish population according to the above with the mentioned theory of a "linguistic change". It is seemingly, however, not completely able to combine with the above mentioned linguistic genealogical tree (Vajda 1968: Tafel 14: 1-2), but on the contrary, with several earlier arhaeological assumptions, for example that already the Comb Ceramics may have been carried by (proto-)Lapps (Gjessing 1954: 7 and 1955: 90), that an "arctic population" on the hunting level in N Finland during the pre-Roman Iron Age may be called Lappish (Meinander 1969: 67) and that one definitely may speak of a Lappish Iron Age in Finnmark beginning in the Roman Iron Age (Simonsen 1967: 66 ff). With these may even Carpelan's own investigation of a dwelling site in Finnish Lapland with a lower level of Iron Age ceramic and stone artefacts be compared (1967: 74 ff), the upper levels of which included rich Medieval finds of a definite Lappish character, likewise Kleppe's (1977: 46) definition of comprehensive grave and dwelling site complexes at Varanger fjord as Lappish at the latest from our chronology's beginning and up to c. 1700 A.D.

One has often attempted to ethnically identify archaeological complexes through tracing the background to historical information on folk groups and their names - above all in a long research tradition on the continental Germanic area. As most recently pointed out by Baudou (1974: 30 f) this, however, meets with both fundamental and practical difficulties. The few classical authors from the first millenium, which are often referred to in similar contexts concerning N Scandinavia, shall, therefore, not be further discussed here (see summarized reviews for example in Collinder 1953: 25 ff and Stenberger 1964: 450 ff). In my opinion it is - as already Hallström pointed out (1929: 89 ff) - most important that all these mention a people which ought to be able to identify with the Lapps during its original Scandinavian/Germanic name - Finns. This ought to be interpreted as a definite indication that knowledge of this people in otherwise unknown ways ought to have wandered S through a Scandinavian linguistic area - that is to say, with greatest probability in the first place through Sweden and/or Norway. In this way, then, we have an indirect evidence of that people with a Scandinavian language must have been in contact with the Lapps - probably also in the Scandinavian area - latest at the beginning of our chronology (compare

Collinder 1953: 32). For such a relationship speak, moreover, also the earlier ancient Scandinavian loans in Lappish (Wiklund 1947: 25 f). Other in tradition and history preserved earlier folk names in the area - above all *kväner* and *tjuder* - do not exist any reasons to discuss in this context (Collinder 1953: 33 f).

Less discussed but of considerably greater extent and probably also considerably more reliable are the later historical information on the extent of the Lappish settlement in Norrland. In addition to pure historical sources - for example the 16th century's tax lists of fisheries and land-measured land (Steckzén 1964: 323 f) - one may here mention above all place names. These sources may not either be the object for reworking in this context, but a couple of main features shall below be briefly mentioned. A tendency to use certain types of ancient monuments as evidence of the distribution of Lappish settlement in historical times - partially concerning the coastal areas' remains of primitive settlement (Steckzén 1964: 189 f) and partially concerning trapping pits in the mountain areas (Manker 1960:193 f) - must, on the other hand, be excluded since these kinds of ancient monuments are clearly functionally conditioned and ethnically unconnected (compare Varenius 1978: 122 ff respectively Selinge 1974 B: 8 ff). A lesser concentration of finds in Arjeplog parish, Lapland, has on the other hand, been interpreted as evidence of a Scandinavian settlement for the purpose of trade in the inner Lappish territory already during the late Iron Age (Serning 1960: 74 ff). An exchange of objects of this kind need, however, hardly be ethnically conditioned but may have a connection with the late exploitation of the hunting dwelling sites (Zachrisson 1976: 96 ff).

Steckzén considers that place names in Norrbotten originally throughout have been Lappish and in the first place tied to fishing locations, which primarily were located in and near the coastal land (1964: 214 ff, 236, Pl. 9). The Swedes and, according to others' interpretations (compare Collinder 1953: 36 f with op.cit.), above all the Finns have begun to explore these areas through a private body of fur traders and tax enforcers (*birkarlar*) first during the 1200's (Steckzén 1964: 262, Westin 1962: 119 f). Even if Steckzén's derivations of place names in many details may be wrong (Dahlstedt 1967: 79), it might still be unavoidable that many names in upper Norrland even in the coastal areas may have Lappish elements or be of completely Lappish origin (Steckzén 1968: 16). The area N of the Skellefteälven received in large namely a permanent Swedish population first after the Peace of Nöteborg 1323 and then foremost because of the activity in the area by the Swedish archiepiscopal see (Dahlstedt 1967: 79, Olofsson 1962: 133 ff, 140, Westin 1962:

120 f). In the county of Västerbotten's coastal areas had before then during the early Middle Ages a colonization taken place, which is indicated by, among others, place names with *-mark* (Olofsson 1962: 153) and which is located N of Ångermanland's most northerly Iron Age settled areas and may be originating from these (compare JBV: 195 Arnäs settled area and 416). Lapland ought on the other hand earliest in its entirety to have Lappish names (Steckzén 1968: 13 f), though many now have been translated or distorted and others even in their earliest form may have included borrowed Scandinavian linguistic goods (Dahlstedt 1965: 148, 1967: 81 ff). The latter relationship is of interest in this context, since one in this way has very early evidence of contacts between Lappish and Scandinavian linguistic areas (compare Collinder 1953: 12). In Middle Norrland there are Lappish names,on the other hand, as far as is known only in the high mountain areas in the W and above all N of Jämtland. Of these only the latter ought , from a chronological viewpoint, to be comparable with the Laplandic ones.

It is namely a general understanding that Jämtland and Härjedalen - except from Frostviken parish - received a Lappish population relatively late in historical times and that the Lapps successively expanded from the N towards the S (Wiklund 1947: 26 f, Collinder 1953: 14). Even if this population is not so late as one from certain directions has wanted to maintain (Nordlander 1899 B: 217 f), it is still clear that it mainly and with exception of the Frostviken Mountains might be accredited to Modern Times (Nordlander 1899 B: 220 f). An immigration of Piteå Lapps appeared for example in N Jämtland during the 1500's (Bromé 1945: 33). At the middle of the 1600's the first information of Lapps in W Jämtland and Härjedalen appears (Bromé 1954: 164) - among others also in the upper Ljungan Valley. In the 1660's they are taken up in the tax book, and the oppositions between them and the farmers begin to be noticed (Bromé 1954: 167 f, compare Collinder 1953: 44 f). At numerous investigations concerning the Lappish taxable areas in the Lunndörren and Oviken Mountains it has also been seen that information on Lapps do not appear before this period (chief surveyor V. Larsson, Östersund, personal communication). Even the archaeological remains of undoubtedly Lappish character make within this area a late impression (Selinge 1977 B: 46). Nordlander (1899 B: 223 ff) considers with direction from place names, in which the word *finne* is included, that Lapps much earlier were existing in greater areas of the province. These names, however, imply in most cases reliable Finnish settlements (compare Gothe 1942: 45). It is not unusual that information on Lapps may appear in traditions and place names also in the coastal provinces of Middle and S Norrland. This information points reliably,

however, only in very unusual exceptional cases to permanent settlement. They may instead indicate partially temporary winter residences and partially a nomadic Lappish - or alleged Lappish - proletariat (Wiklund 1947: 27).

Against the background of these historical sources I consider it clearly evidenced that Lapps, in an ethnical demonstrable meaning, have existed within upper Norrland at least from the beginning of our chronology and probably earlier and that they, in any case to the end of the prehistoric period and in certain cases probably considerably longer, left the latest material on the hunting culture's dwelling sites behind (compare 6.2.4 above, Hvarfner 1957 B: 110 f, Westin 1962: 62, Zachrisson 1976: 96 ff). It is probable that the cultural pattern fundamentally still was that of the time-honoured and mobile hunting culture, which may have operated in principle in a similar way as the Lappish hunting culture in historical times in the Kemi Lappish territory, where this is unusually well-known (Tegengren 1952: especially 127 f). The question of the origin of reindeer nomadism and its connection to the hunting culture falls outside of this investigation (compare Vajda 1968: 474 ff). A contact area with a culture, based in a Scandinavian context, may during the late Iron Age has lain in Åsele Lappish territory and other parts of the upper basin of the Ångermanälven (Hvarfner 1957: 83 ff, Westin 1962: 107 f). On the other hand may no reliable historical contact be established between these ethnic groups during the prehistoric period within the current area of investigation or in S Norrland on the whole, where the Lapps according to historical sources appear considerably later. These sources refer here only to a Scandinavian, mainly agrarian culture during the Middle Ages (compare 6.2.6 above). Guided by the above established continuity, I consider it to be evidenced that this is valid also for prehistoric times in the same area as far as an ethnical reasoning is meaningful. The earlier delimitation for the ethnically definable cultural systems or parts of these is, on the other hand, more difficult to judge. It is depending not only on the reviewed understandings of the Lapps' origin, founded in different sciences, and an evaluation of the Scandinavian cultural elements, but also of the model or the combination of variables from the two in the preceeding chapter sketched models, of the cultural systems' processual development which seem to be most probable. The ethnical factors may, therefore, in an attempt to a conclusive synthesis be weighed together with these models.

6.3.4 Synthesis

A concluding weighing together of the models and facts which have been discussed in the immediately preceeding chapters must, to a great degree, be subjective and partially depending on the standpoint one accepts to theoretical

and fundamental points of origin. The interpretation which here is presented has, therefore, in the first place the character of a personal evaluation after a prolonged occupation with both facts and hypotheses within Middle Norrland's prehistory. As such it is possibly not without interest, but it is nearly a matter of course that researchers with other points of origin might come to other understandings. The essential in this work is the factual material and the arguments for different interpretations of this which has been presented and discussed in the preceeding. The factual material will, with completions and revisions of the data, be lasting for the future. The arguments and interpretations shall be replaced by more relevant and in facts more well-established through a future research process. This lastly presented personal evaluation might with a different background receive another appearance already in today's situation and is, therefore, the part of this work which most quickly shall be out-of-date. It may, therefore, be summarized without further argumentation or quotation to sources or literature. As the point of departure I choose the standpoint that the adaptive model (Fig. 31) is the one, which in today's research situation in the first place is applicable but that it in many details has to be combined with or replaced by elements from the diffusionistic model (Fig. 30). A more careful analysis of the two models' reliability should probably reveal that the most plausible interpretation should include more of a degree than of a kind difference between their probability. The interpretations which are presented refer, of course, in the first place to the Ljungan Valley, but they might to a great extent be applicable also to the nearlying river valleys in the N and S and in a limited extent also to the river valleys in N Svealand and N Norrland.

During the Mesolithic Period with probable beginning during the seventh millenium B.C. a successive immigration of probably smaller groups of people took place, which to the area brought along economic and social systems, which were adjusted and adapted to other environments but now constituted the incentives to the hunting culture's system in the river valley. At least two folk groups have carried the immigration cultural forms - one from N-E and one from S-W, possibly a third group may also have existed along the E coast. Completely lacking knowledge of these peoples' ethnical and anthropological identity we may call them archaic. Both may, in the last place, have come from Middle Europe, but the easterly one may probably as in Finland have strong elements of a more east-continental character. It should, however, mean too strong a pressure of the source situation to even tentatively characterize their anthropological nature as "Europid" respectively "Mongoloid" - especially the latter is highly uncertain. The southerly group ought to be nearly

related to the mesolithic groups in S Scandinavia. It is impossible to have any based understanding in the question, whether a common "archaic" language was created after a more or less thorough acculturation, and if this in such a case was taken over from the southerly or the easterly group or possibly received elements from both. It is not, of course, either known which linguistic group(s) this archaic language(s) belonged to, but it is more probable that it (they) was(were) related to the earlier forms of (one of) the language stems which are today met in the Fennoscandic area, than that it (they) belonged to an unknown one. Because of the culture's mobile system, there surely existed relationships with other parts of Norrland, but its own area's internal conditions strongly influenced the formation of the cultural system in an adaptive way. The seasonal mobility may principally have been connected to its own valley in an E-W direction. The relative combination of the two involved anthropological elements has probably not been the same within the hunting culture in different parts of Norrland. The easterly group ought to have dominated in the N - possibly strongly - and the southerly in the S, without that needing to result in archaeologically evidenceable differences in the remaining source material - at least not without detailed investigations. Its character has to a great extent been conditioned by, in large, common, human ecological prerequisites within a large N European area.

Early and Middle Neolithic Periods were characterized by an internal ethnic and cultural continuity within the hunting culture's system. New additions within the technical sector might be the result of an internal adaptive development - above all for objects of northerly character - or of a limited diffusion both from the S and N without this today may be reliably decided. The sparse neolithic elements were an innovation which ought to have entered with an immigration from the S, probably of very modest extent. Because of this group's acculturation with the earlier hunting culture, whose social system and mobile cultural pattern remained in principle unchanged, arose a sub-neolithic variety of the hunting culture, somewhat modified in an economic respect. It was still probably limited to the lower river valley but there carried by mobile groups with home base territories in the inland. The population addition has probably been too unimportant in order to influence the anthropological picture in an appreciable extent, and the newcomers might have been related with the hunting culture's earlier southerly element. It is not possible to say if their language deviated from the archaic, but if that was the case the immigrants may have introduced a language of early Indo-European type. It does not seem probable but it is not either impossible that this may have, to a greater or smaller extent, replaced or modified the

archaic language.

During the Late Neolithic and Bronze Age both a "pure" hunting culture of the mesolithic type and the sub-neolithic variety continued their uninterrupted development, the latter as a temporary and spatial variety of the former with the same ethnical foundation. During the period's later part, this subsidiary system was spread also into the inland. Early during the period a marked new stone technique was introduced which had correspondences within large parts of N Fenno-Scandia and farther to the E. The whole of this area ought to have experienced a similar development on an adaptive basis, but a certain idea diffusion from the S to Middle Norrland is not excluded. The change in technique was probably connected to a certain increase in population, by which the causal explanation may lie in a mutual influence between these factors and these have made possible a somewhat increasing extraction of energy from the environment. The first permanently built grave constructions are evidenced as a principle innovation within the hunting culture's coastal territory, probably under a certain ideal influence from the S, which might have introduced permanence to an earlier more short-term disposal of the dead. It is improbable that any appreciable ethnic or anthropological changes took place in S Norrland during this period. On the other hand, a successive ethnic addition to N Norrland in the form of spread immigration of certain extent from the E appeared, probably during this period's later part and the beginning of the next one. This migration had parallels within other parts of the Arctic area of the Scandinavian countries and Russia, and implied a certain easterly addition to the archaic anthropological tribe. In connection with this a language change took place under influence from the Finnish area, which gradually included upper Norrland and meant that the archaic language was replaced by or changed to (proto-) Lappish even within the earlier population.

During the Early Iron Age the hunting culture continued to begin with in the inland rather uninfluenced, probably both in its "pure" and its sub-neolithic varieties. In this environment a burial tradition grew up which mainly was built upon an internal development, involving that a memorial tradition received greater permanence and a certain social differentiation. The burial tradition might, however, to a certain degree - and above all in details - have been influenced by an idea diffusion within the hunting culture's frame - either from the S in the inland or from the burial tradition at the coast or both. Grave constructions in the coastal hunting environment still occurred.

Within the lower river valleys an agrarian, sedentary cultural system developed under internal pressure, partially from a deterioration of the climatic conditions and partially from a preceeding increase in population, on the basis of the, through these factors, partly collapsed sub-neolithic hunting system. The change in system took place, however, probably also during relatively strong cultural stimulance both from the S and the W, and it is possible that a rather limited population addition from Middle Sweden might have been the carriers of a number of these ideas. These immigrants have in such a case surely spoken an ancient Scandinavian language, but the existing archaic language had probably already been related with this - at least from the Middle Neolithic but possibly already from the Mesolithic (compare above). An economic and ideal exchange on a reciprocal base from and to both the S and the W arose as soon as the new system economically and socially was stabilized. With the sedentary settlement followed a social stratification which was expressed in a selective burial tradition. The graves obtained - besides their memorial value - probably a function as symbols for the territorial proprietary. The rather virgin cultivable sediment soils favoured colonization and allowed a relatively quick population increase and expansion of the central Iron Age settled areas. Contacts with a surviving hunting population took place - probably more or less continually - and from this system the extensive exploitation of the outfields was taken over. This exploitation and the gradually increasing exchange with the hunting system in the inland created a surplus, which might support an exchange with the surrounding world. During the Migration Period redistributive centers, consequently, appeared in the coastal areas, which at the same time satisfied one of the basic needs created by the settlement development and for their own part simultaneously exploited and supported the prosperity. They exploited a hinterland in the hunting grounds in a cultural symbios with the hunting population and developed a tendency towards a marked chieftainship. These higher social units were characterized by an accumulated relative wealth, noticeable in the grave constructions.

This development was broken temporarily during the Late Iron Age's first part of still unclear reasons. These had, however, probably a connection with the homogeneous, one-sided agrarian cultivation system, the extent of cultivation in time within the same areas and tendencies to total colonization with a certain locking of the system - possibly also with ecological relationships. The crisis was overcome probably partly through a certain natural recovery after temporary abandonment but might also have been opposed by a certain reorganization of the cultivation system, even if no reliable

documents for this are available. During the Viking Age, then, a renewed agricultural expansion followed. In Medelpad this had to a certain extent probably the form of a recultivation of abandoned units, within other provinces of Middle Norrland it was expressed mainly in new colonization. The symbiosis with the surviving hunting system continued in the Late Iron Age, but gradually this passed into a more direct exploitation of the hunting grounds as outfields and commons to the agrarian culture, by which the remaining hunting population changed into a sedentary, agrarian population. Construction of graves at the coastal line ceased completely in the beginning of this period and the ones in the inland grew fewer, which had a connection with the hunting system's successive decline. At the transition to historical times an extensive, expansive tendency was reigning both in the settlement historical and economical respects. This obtained, however, not as during the Migration Period a regional social super-structure with tendencies to a chieftainship. Instead, the area was incorporated, probably in the form of a rather affluent but egalitarian farming society, in the sphere of interest to a growing central power with its center in the Mälar Valley. Spatial organizational models might have been developed during this period, but they are not evidenced before the time of historical sources.

During the early Middle Ages the settlement expansion continued - if anything in an increasing pace - up along the river valleys, between the coastal land's earlier settled areas and along the coast farther N. All of the remnants of the hunting culture as a self-supporting or a filial system disappeared in S Norrland, and the disposition of the commons and outfields was regulated as other settlement conditions in the growing establishment of laws. The organized society, which now was appearing and which may be studied in another way, since the shift in religion had replaced the most important archaeological sources with the gradually growing historical ones, was, however, built to many important parts on the foundation laid during the Iron Age and had also several lines of relation backwards to the hunting culture's system of several thousand years. The connection is clearest in the human ecological and economic spheres but clear lines backwards also exist in the social and probably also in the organizational fields. An exchange of historical sources might not be allowed to prevent us from seeing the long continual lines in the development of the human society and its environment in Middle Norrland.

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31. An innovatory culture-processual model

Fig. 1 Outline map of the Ljungan river basin

The map illustrates the location of the investigation area in middle Norrland. The relationships to the provinces and to some geographical conditions are illustrated. The water-courses and water-sheds are given according to Water-course Map, middle sheet, by Svenska Reproduktions AB and the highest coastline mainly according to National Atlas of Sweden 23-24. All maps of this character are oriented in the national mapping network according to the National Land Survey of Sweden.

The following water-courses are numbered on the map:

1. *Skärkan tributary*
2. *Storsjön*
3. *Grucken lakes*
4. *Flåsjön*
5. *Börtnan lakes*
6. *Storsjön-Lossasjön-Alanäs-sjön lake system*
7. *Åsen-Kvarn-Kvarnsjön lake system*
8. *Rätansjön*
9. *Handsjön*
10. *Lake Havern*
11. *Holmsjön (in Haverö parish)*
12. *Ångesjön*
13. *Borgsjön*
14. *Torpsjön*
15. *Hungesjöarna*
16. *Locknesjön*
17. *Sodsjön*
18. *Revsundssjön lake system*
19. *Idsjön*
20. *Gimån tributary*
21. *Holmsjön (in Holm parish)*
22. *Lake Leringen*
23. *Stödesjön*
24. *Viggesjön*
25. *Lake Marmen*
26. *Lake Öjen*
27. *Selångersån river*

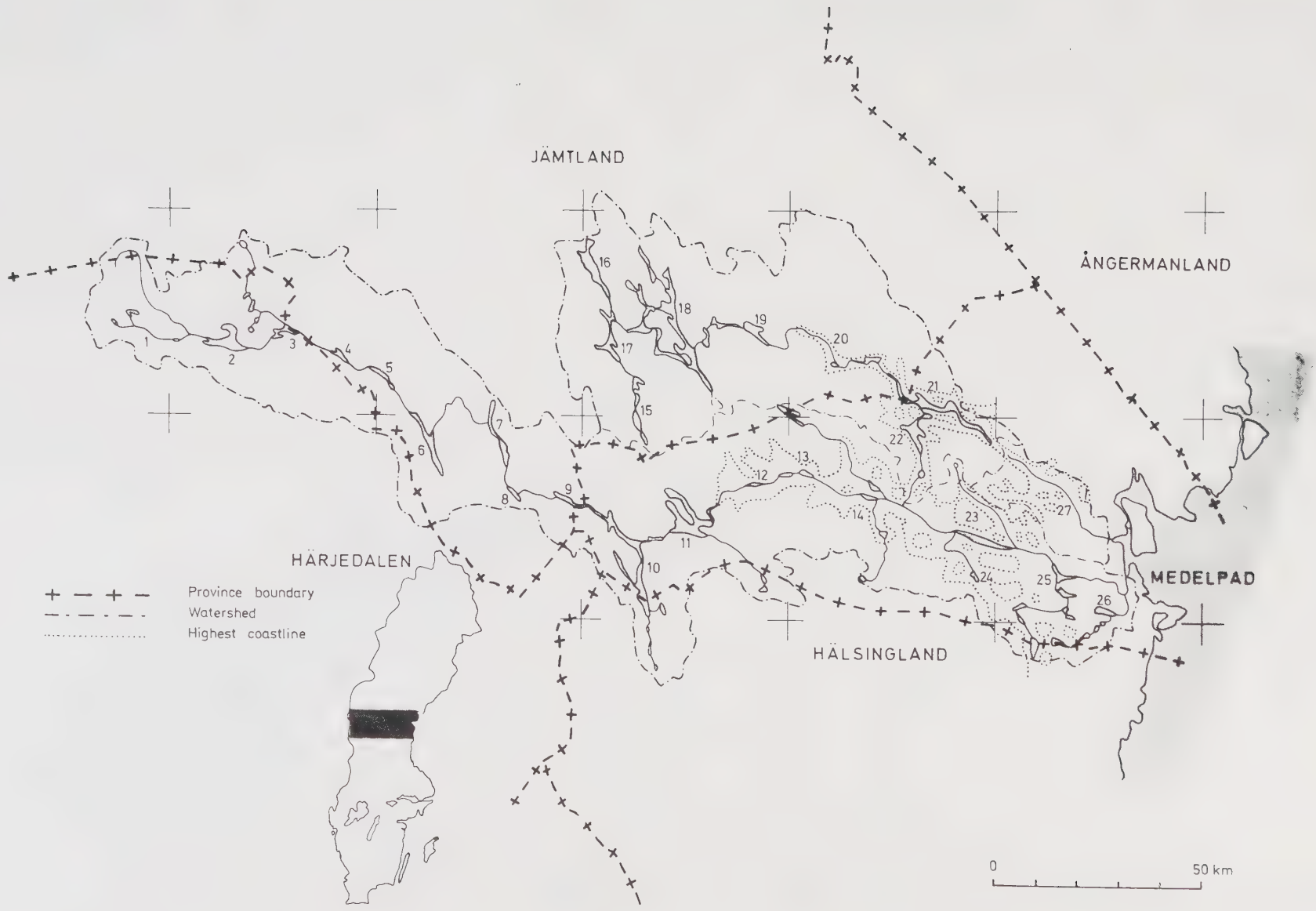

JÄMTLAND
ÅNGERMANLAND
HÄRJEDALEN
HÄLSINGLAND
MEDELPAD
Province boundary
Watershed
Highest coastline
0
50 km

Fig. 2. Present state of ancient monument survey in the Ljungan river basin. Watercourses with extra bold contours are surveyed in connection with water regulation schemes. Areas east of the dotted line in the upper valley are regularly surveyed for the Economic Map of Sweden. Stone Age sites are, however, regularly sought for only within the shaded area.

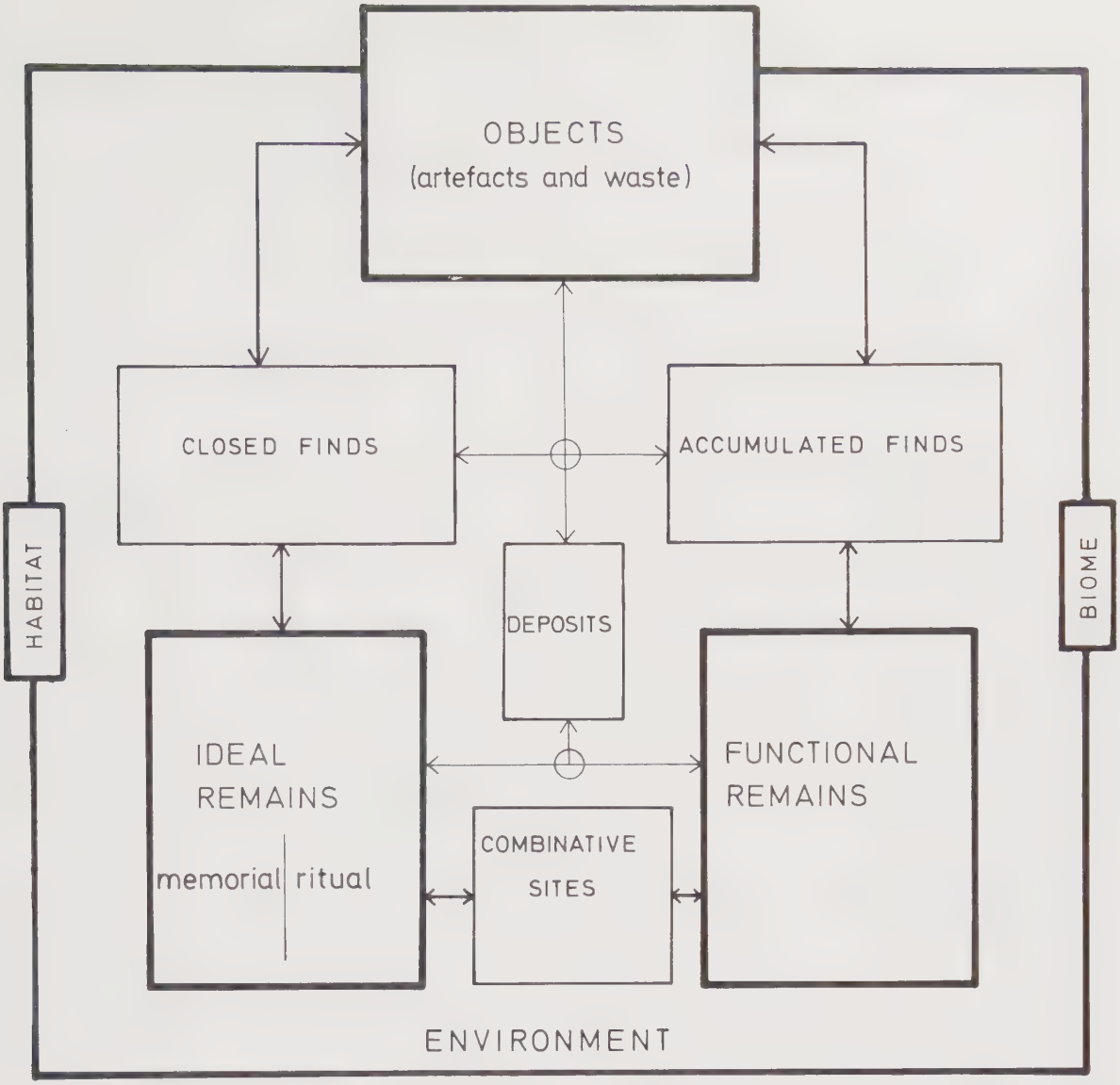


Fig. 3 A model of the archaeological source, illustrated as it is in an open system. All arrows illustrate reversible connections, and the two junctions make connections in every direction possible. The three big boxes in a bold contour line illustrate the three fundamental source groups of remains, and the other three boxes in the main cycle may be defined as combinations of these in the indicated positions (a closed find is for instance mostly a combination of objects and ideal remains). The central box "deposits" - the term is taken in a wide sense - illustrate kinds of remains, as a rule more unusual, that not fit into the main cycle. A deposit may for instance be an accumulated find in an ideal remain (for example megalithic grave finds), a closed find in a functional remain (for example a coin depot in a house foundation) or single or accumulated objects in a sacred site (for example bog deposits). All remains are normally encompassed in an environmental context - illustrated in the external frame of the model - which is an integrated part of the source system. It may principally be devided in habitat and biome or unorganic resp. organic environment. Single objects without a known environmental context may nevertheless have a delimited source value, for instance from a typological point of view.

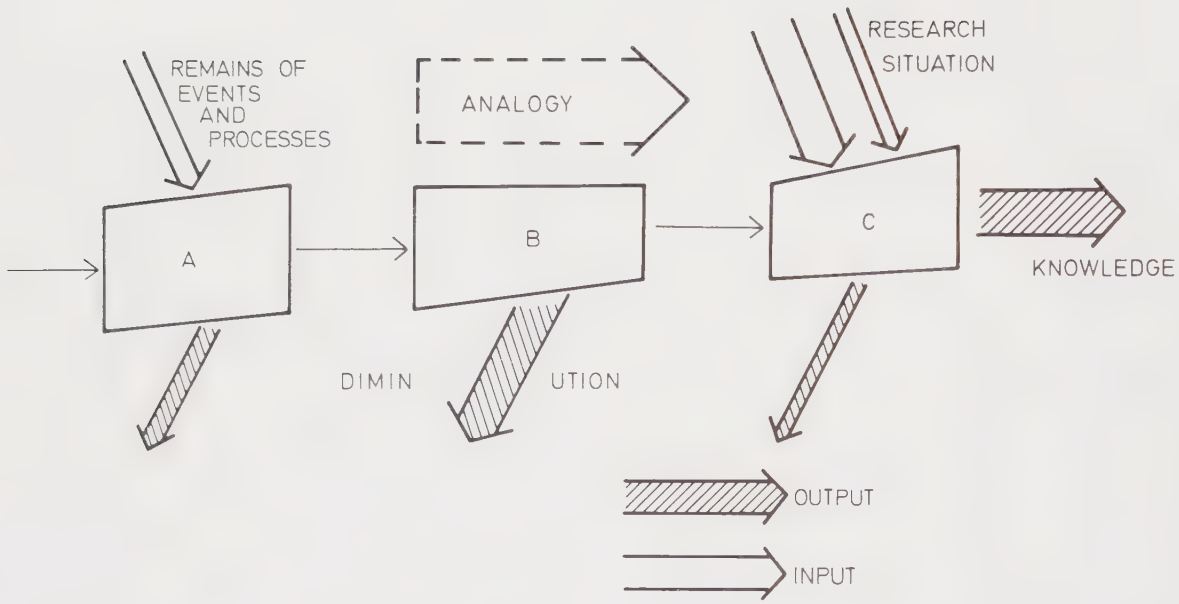


Fig. 4. A dynamic model of the development of the archaeological source system through time, illustrated by three boxes for the latest phase of the prehistoric time, the historic time before archaeological research and the research situation today. The source system is enlarged by input in the upper part of the model - quantitatively in the prehistoric time and qualitatively in the research situation. The system is reduced in the lower part by diminution and has finally an output of knowledge. It may have changes during the historic time in the same area.

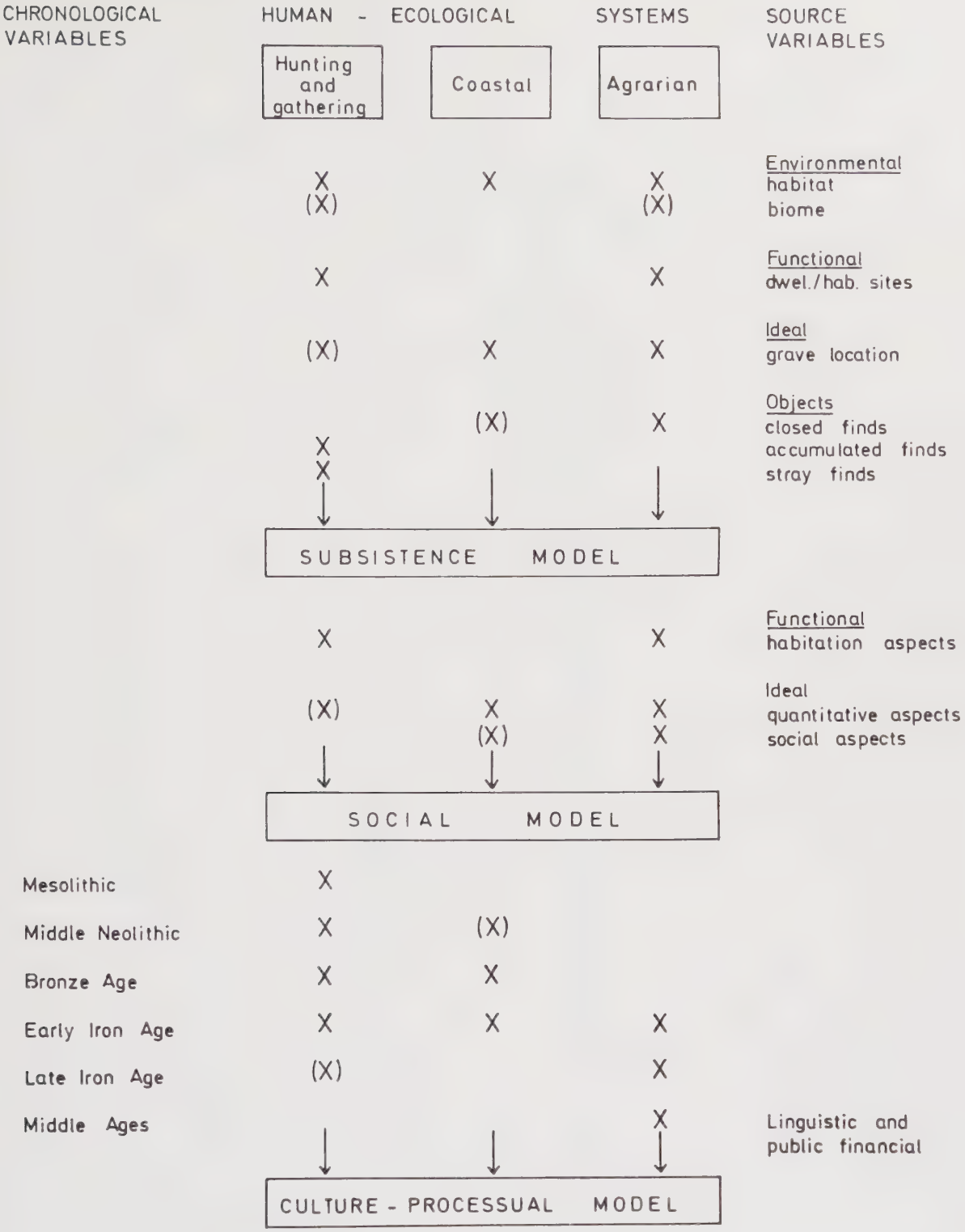


Fig. 5. A model of the investigation trajectory according to the three empirically postulated human-ecological systems, the source variables - in accordance with the source model - and the traditional chronological variables. The investigation runs through three model stages, and the presence of source variables at every stage is indicated. X means occurrence of important and/or determining proportions, (X) occurrence of almost negligible or unimportant proportions.

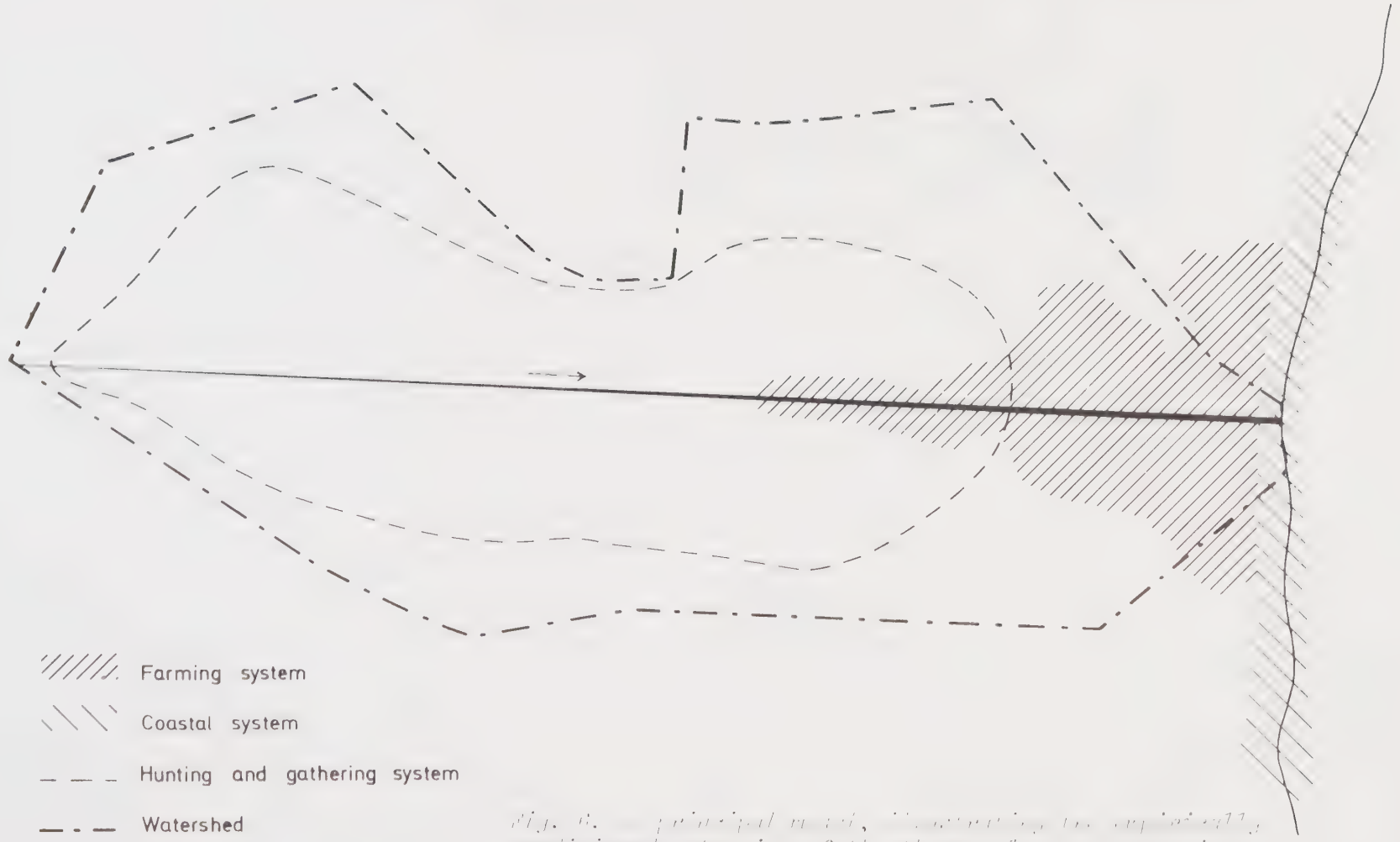


Fig. 6. [illegible] principal [illegible], illustrating the [illegible] additional extension of the three culture systems in the Ljungan Valley.

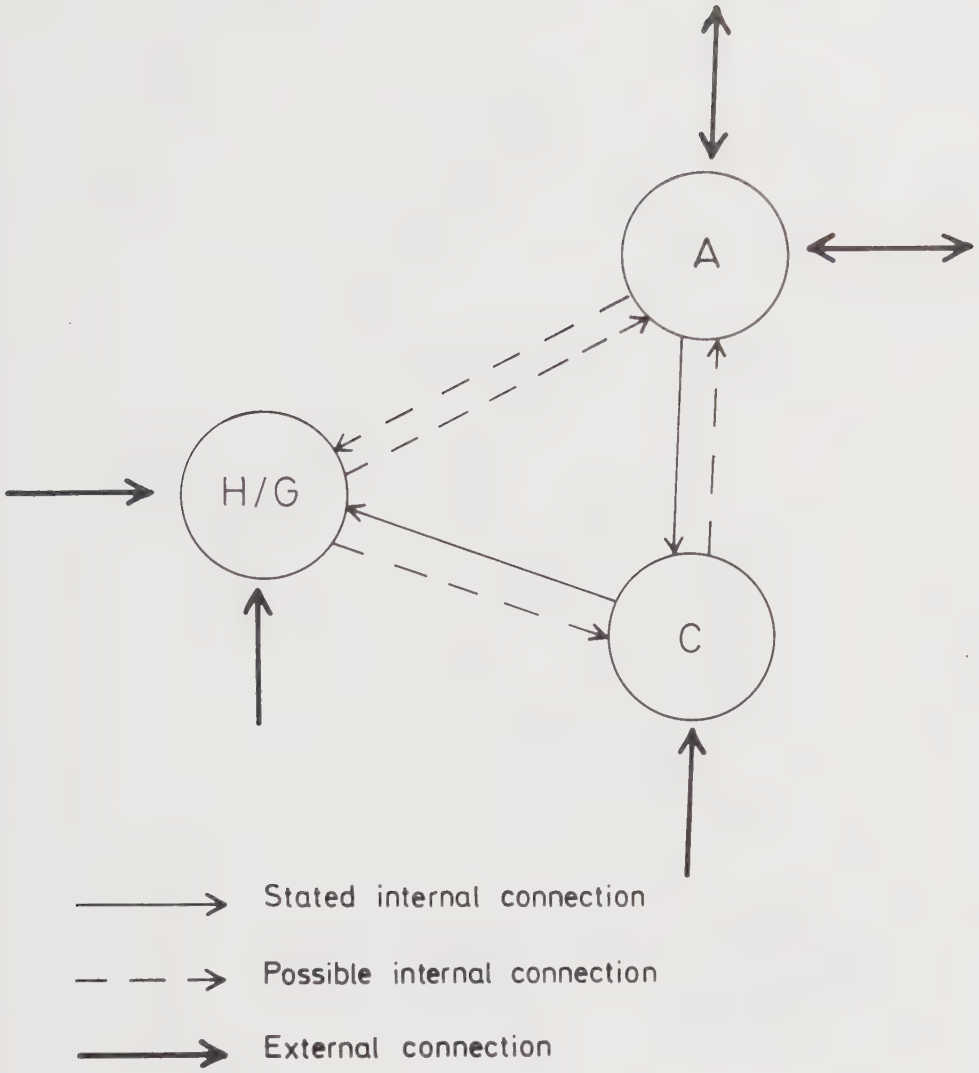


Fig. 7. A rough, principal model of the culture systems in the Ljungan Valley and their empirically conditioned, hypothetical internal and external connections. A = the agrarian system, C = the coastal system, H/G = the hunting and gathering system.

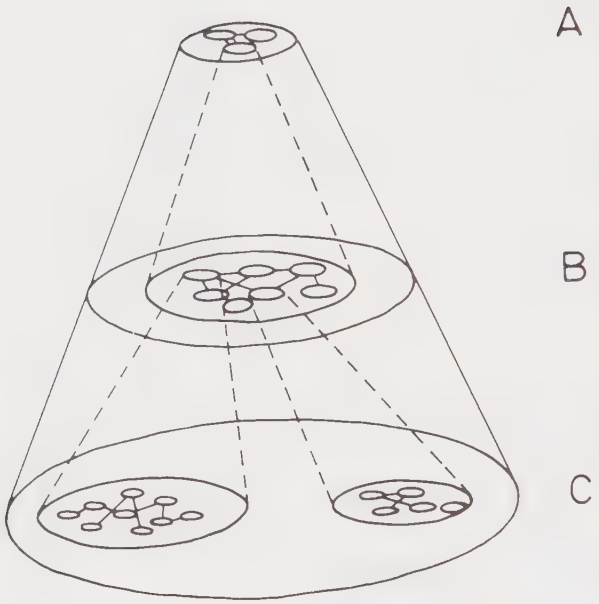


Fig. 3. An "analysis cone" model illustrating the principal systems theoretical thinking in different hierarchical levels, applicable to the culture systems in the Ljungan Valley. After Hodson 1976.

Fig. 3. Frequency map, showing the distribution of Stone Age sites, according to the Register of Ancient Monuments.

Fig. 10. A graph with the surveyed lengths of the Stone Age sites in the parishes Rätan, Åsarna and Klövsjö, Ljungan Valley.

Fig. 11. Frequency map showing the distribution of a sample of Stone Axe [illegible] in the province of Medelpad, divided into northerly and southerly types.

Fig. 12. Distribution map, showing the grave localities at the lake shores, according to the Register of Ancient Monuments. The number of graves at each site is indicated.

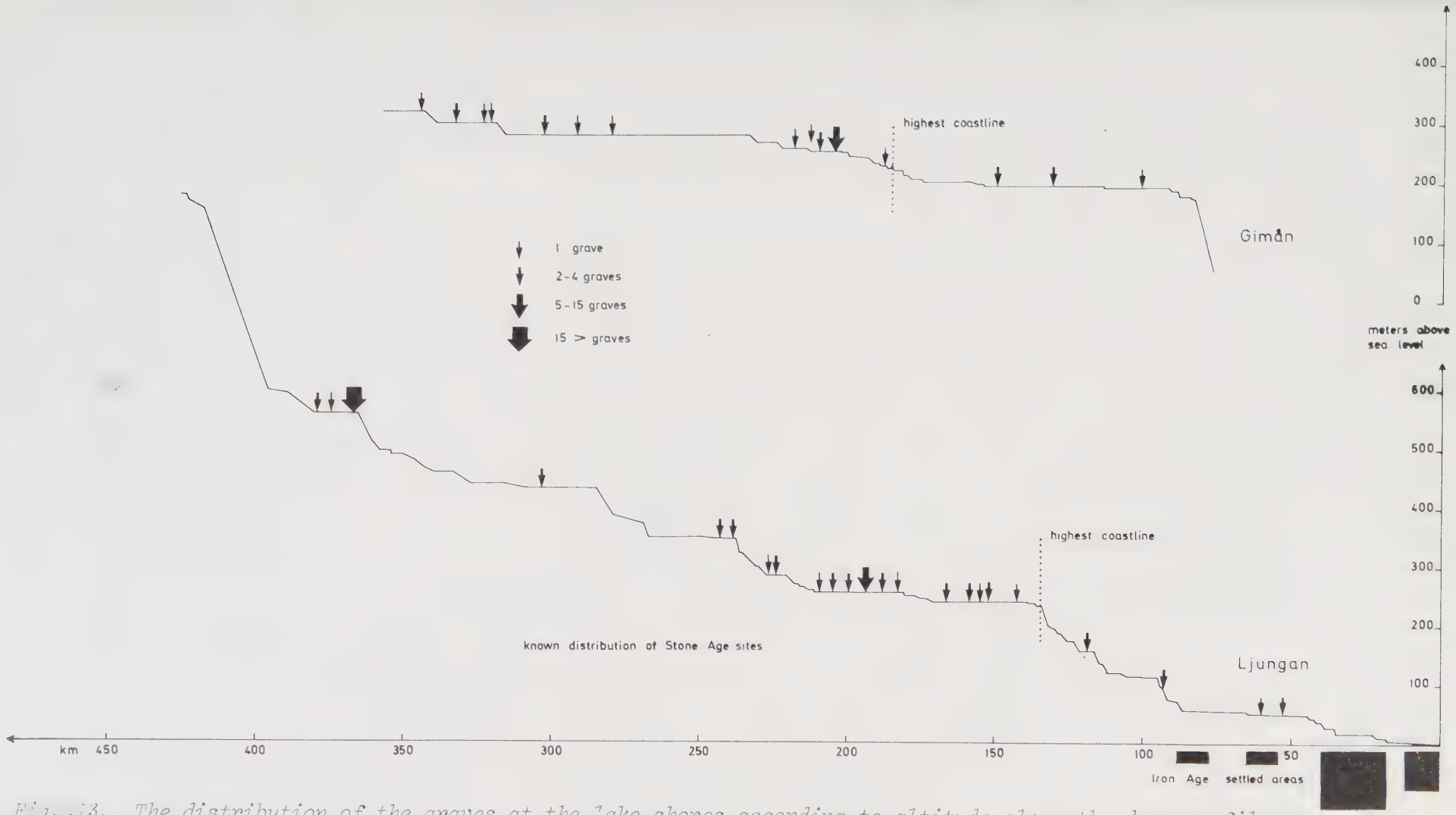


Fig. 13. The distribution of the graves at the lake shores according to altitude along the drop profiles of the rivers Ljungan and Gimån. For comparison, the very approximate extension of the areas with Stone Age sites and the Iron Age settled areas - that is to say those of Njurunda, Tuna-Attmar, Stöde and Torp - may be projected on the main river.

Fig. 14. Frequency map, showing the distribution of trapping pits in the Ljungan river basin, according to the Register of Ancient Monuments.

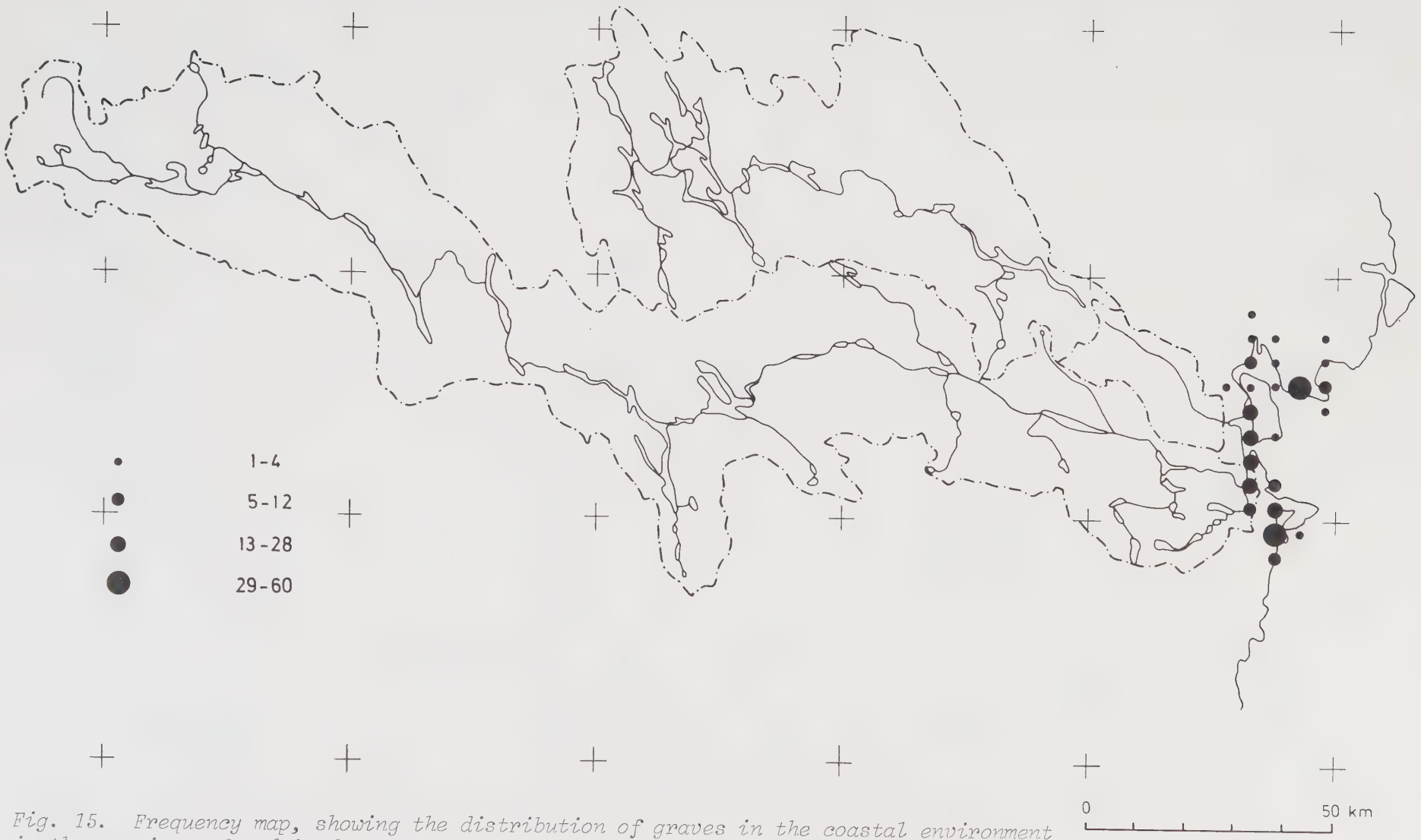


Fig. 15. Frequency map, showing the distribution of graves in the coastal environment in the province of Medelpad, according to the Register of Ancient Monuments.

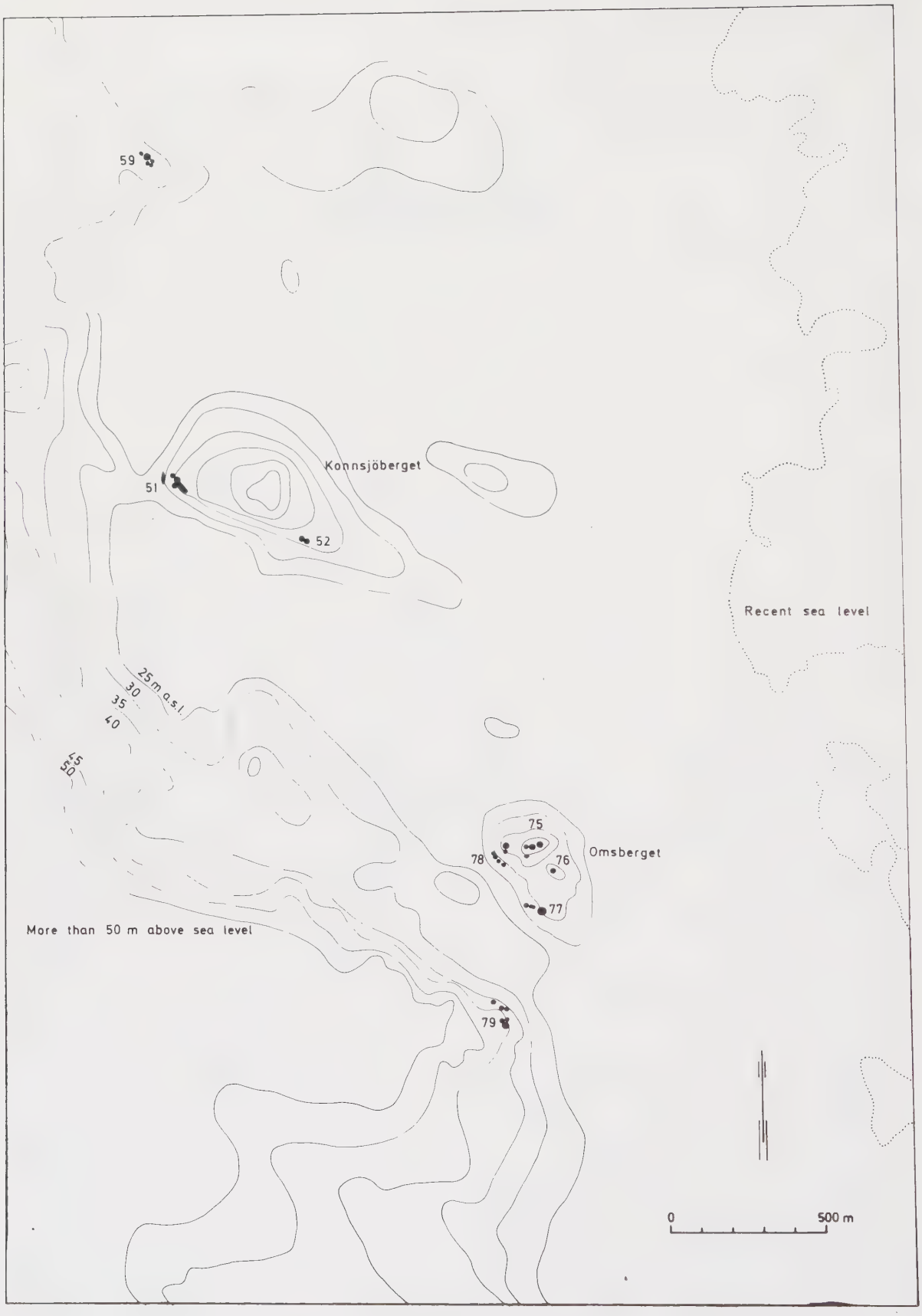


Fig. 16. Detailed map of eight localities with graves in the coastal environment of Medelpad, predominantly cairns but in some cases stone settings, related to prehistoric sea levels. Numbers refer to the Register of Ancient Monuments for Njurunda parish. After Economic Map of Sweden, sheets 16 H 9h and 17 H Oh.

Grave (cairn) 12 m in diameter or more
Grave (cairn or stone setting) up to 12 m in diameter
Heap of cracked stone, 12 m or more
Heap of cracked stone, upp to 12 m.
0
500 m

Fig. 17. Environmental setting of Bronze Age character on forested ground at Kragsta, Ununge parish, Uppland. The lowermost curve represents 20 m above sea level, i.e. an approximate sea level around or somewhat after 1000 B.C. (Åse 1970: fig. 2 and 7). No archaeological datings are known, and it cannot be stated that the remains are shore-bound. After photographic field maps 11 J 8a and 8b.

Fig. 18. Frequency map, showing the distribution of graves in the Iron Age settled areas of the Ljungan Valley, along with some similar graves in the high mountain valleys.

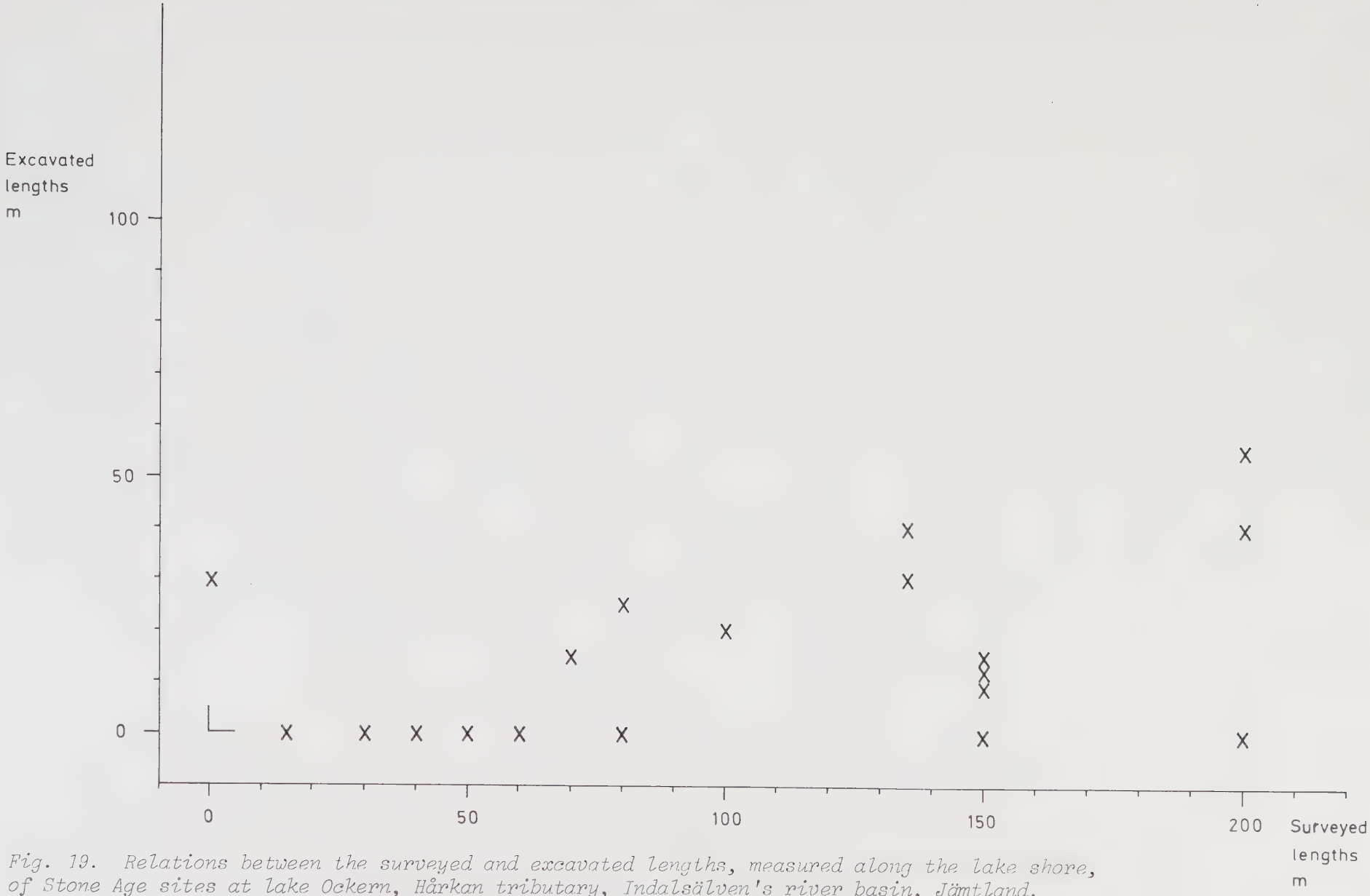


Fig. 19. Relations between the surveyed and excavated lengths, measured along the lake shore, of Stone Age sites at lake Ockern, Hårkan tributary, Indalsälven's river basin, Jämtland. Sites with 0 m excavated length have been judged as totally eroded.

Fig. 1. Map of the Klövsjö lake system with the distribution of the Stone Age dwelling sites, the hunting pits and a single grave site at the lake shore. Topographical details by permission of, after Topographical Map 2C Sweden, Sheet 19 J Fjällnäs.

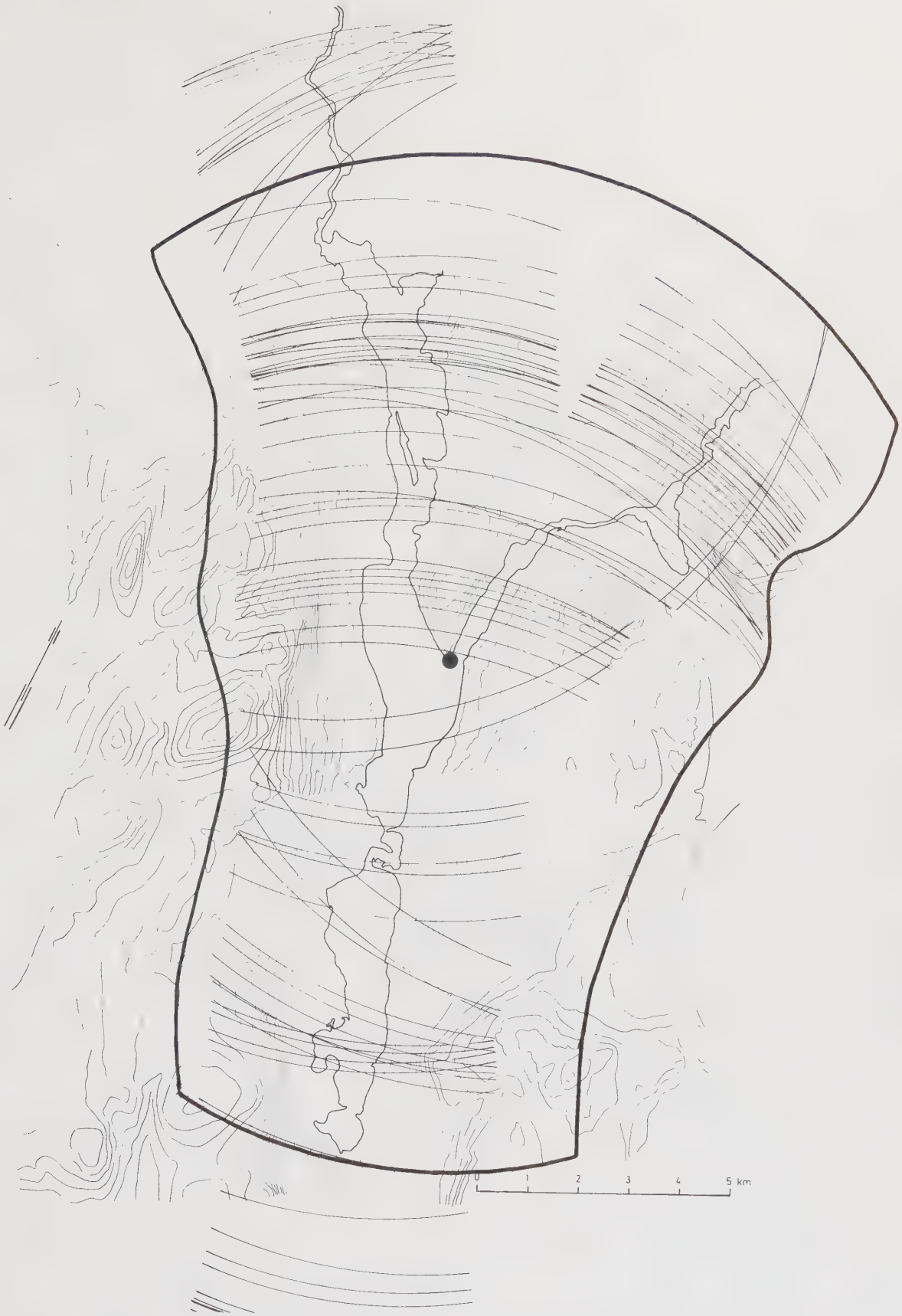


Fig. 21. Partially marked boundaries for presupposed catchment areas with a 10 km radius for all the dwelling sites in the Klövsjö lake system. The bold contour line marks the whole catchment area for the pointed out site on the promontory in Lännässjön. Compare fig. 20.

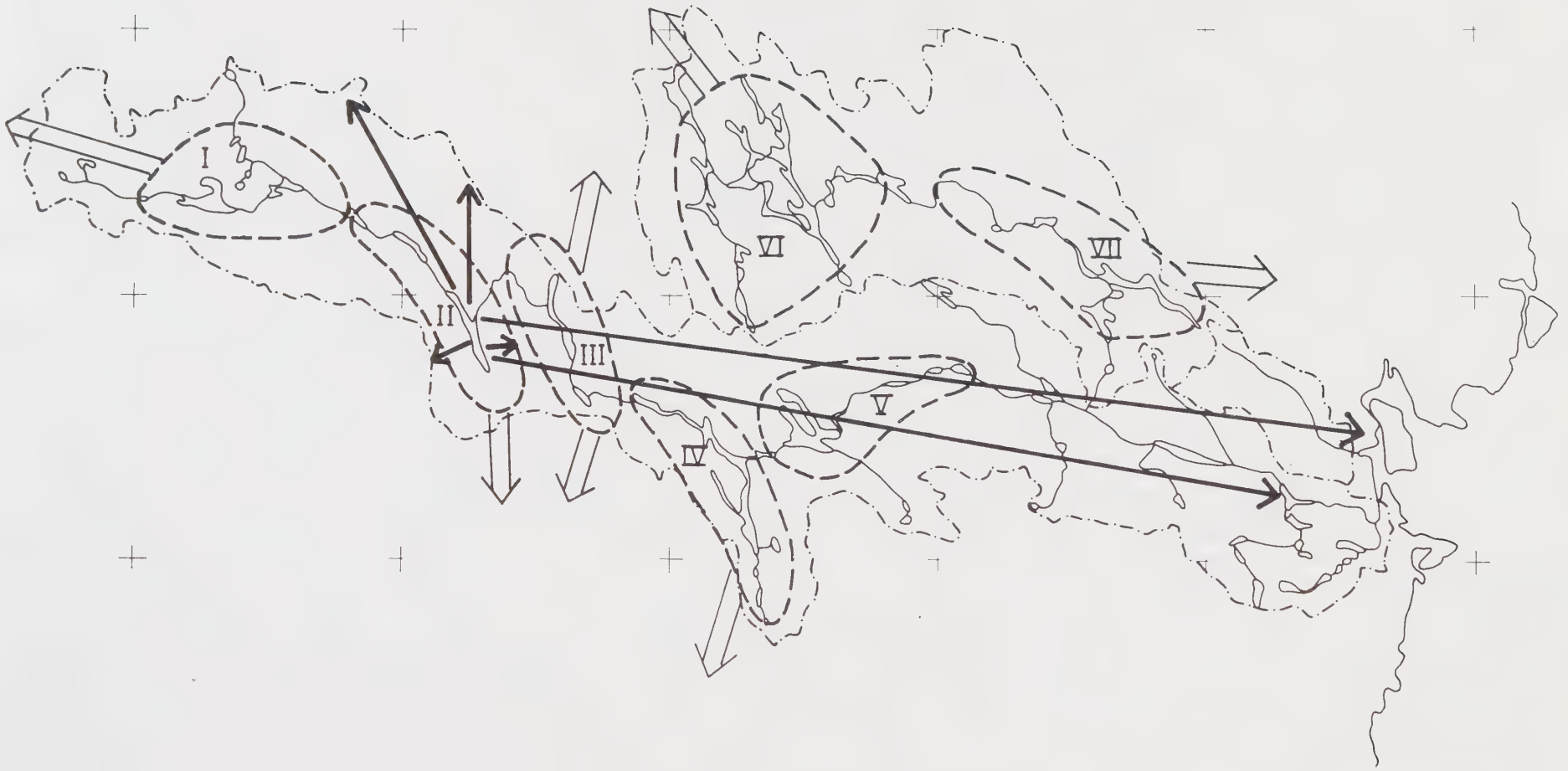


Fig. 22. Model of home base territories for seven presupposed Stone Age social units in Ljungan Valley. Black arrows illustrate seasonal movements within the unit of the Klövsjö lake system, open arrows show possible connections out of the valley.

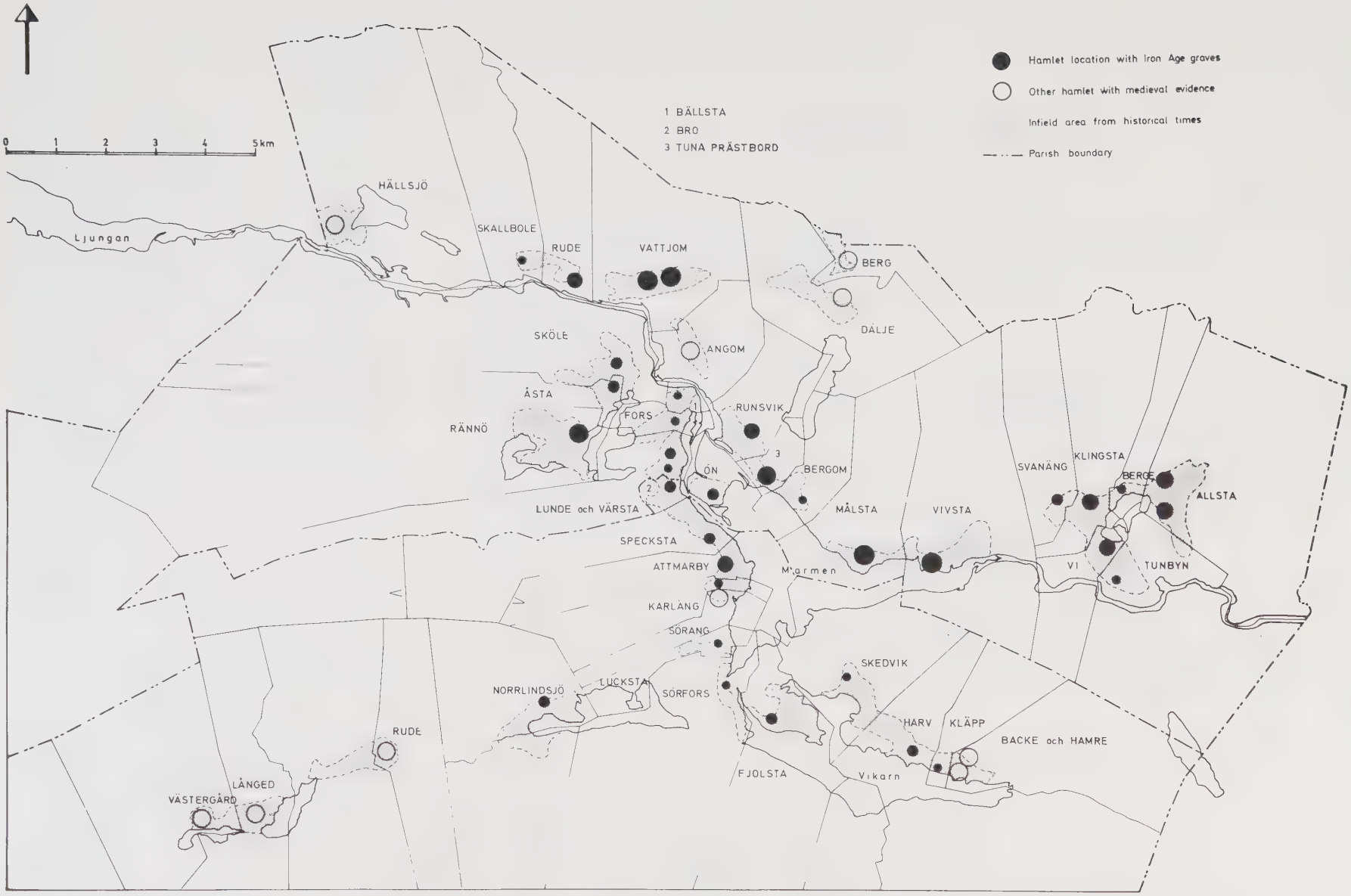
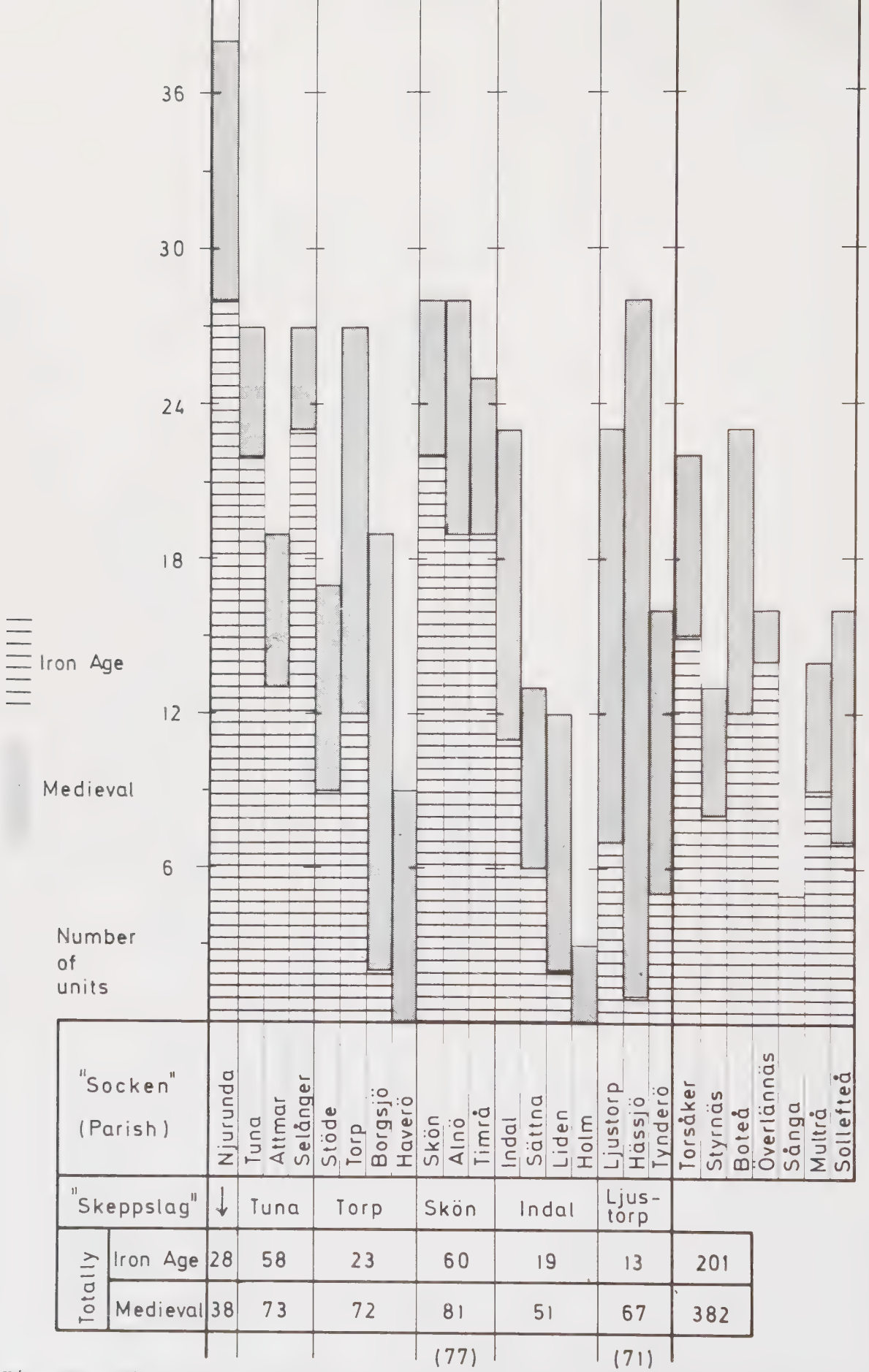


Fig. 23. Model of the basic social units of the Tuna-Attmar settled area during Iron Age and the Middle Ages in accordance with the hamlet locations and hamlet boundaries in historical times.



		Njurunda	Tuna	Torp	Skön	Indal	Ljus-torp	
Totally	Iron Age	28	58	23	60	19	13	201
	Medieval	38	73	72	81	51	67	382

Fig. 31. Histogram comparing the number of Iron Age and Medieval units in the parishes and skeppslag in the province of Medelpad together with a control area in the province of Ångermanland.

Skeppslag headings (IA Iron Age)	-vin names	-hem names	-land names	-sta names	cultic or administrative names	uncompound nature names	compound nature names	-säter and -bo names	-bol and -böle names	partition or avgärda names	other names	Total	Remarks
Njurunda skeppslag													
with IA remains	1	1		3	1	11	6	2	1	1	1	28	Byn
without IA remains			1			1	6				2	10	-by, -by
Total	1	1	1	3	1	12	12	2	1	1	3	38	
Tuna skeppslag													
with IA remains	1	1		15	4	21	11	1	2	1	1	58	-åker
without IA remains				1		6	6		1	1		15	
Total	1	1		16	4	27	17	1	3	2	1	73	
Torps skeppslag													
with IA remains			1	10		6	3				3	23	Byn, -by, -byn
without IA remains	1		1	3		18	13	5	2	2	4	49	By, Byn, 2 -byn
Total	1		2	13		24	16	5	2	2	7	72	
Sköns skeppslag													
with IA remains	5		5	18	3	15	5			4	5	60	2 Byn, -by, Prästb., -åker
without IA remains			1	1		7	6	2	2	1	1	21	Byn
Total	5		6	19	3	22	11	2	2	5	6	81	
Indals skeppslag													
with IA remains				5		8	3	1	1		1	19	Byn
without IA remains		1		4		10	8	3	1	2	3	32	2 Byn, -lösa
Total		1		9		18	11	4	2	2	4	51	
Ljustorps skeppslag													
with IA remains	2			1	2	4				2	2	13	Prästb., -åker
without IA remains		2	1	2		20	18		3	2	6	54	Bye, Byn, -by, -byn, 2 -åker
Total	2	2	1	3	2	24	18		3	4	8	67	
Total Medelpad													
with IA remains	9	2	6	52	10	65	28	4	4	8	13	201	
without IA remains	1	3	4	11		62	57	10	9	8	16	181	
Total	10	5	10	63	10	127	85	14	13	16	29	382	
Occurrence of IA remains on name type %	90	40	60	83	100	51	33	29	31	50		53	38 % for Byn, -by(n)
Average of IA remains per name unit	10	71	11	15	26	10	11	9	10	7			5 for Byn, -by(n)
Control area Ångermanland													
Boteå skeppslag													
with IA remains	4	6		4	1	11	11				2	39	2 -by
without IA remains		3		5		5	4		1			18	
Total	4	9		9	1	16	15		1		2	57	
Ådalen settled area													
with IA remains	6	9		16	2	17	15			1	4	70	Tomte, Ödh
without IA remains		4	1	10		10	7		1		6	39	2 -by(n), 2 -åker
Total	6	13	1	26	2	27	22		1	1	10	109	
Occurrence of IA remains on name type	100	69	0	62	100	63	68		0				50 % for -by(n)
Average of IA remains per name unit	7	6	0	7	8	11	12						10 for -by(n)

Fig. 25. Table of early settlement names, evidenced in sources from the Middle Ages and up to 1550, in the province of Medelpad and a control area in Ångermanland. The names are listed per skeppslag (compare fig. 24) according to name type and the occurrence of Iron Age remains, predominatly graves.

Fig. 26. Distribution map of historically known hamlets from sources of the 1500's, the colonization of which may be evidenced as originating in the Iron Age through presence of ancient monuments.

Fig. 27. Distribution map of historically known hamlets from sources of the 1500's, che colonization of which may be evidenced as originating in the Middle Ages through absence of ancient monuments.

a Vicariates 1314	b Settled units c 1100	c Six year tithes 1314	d Settled units c 1540	e Number of nominati c 1540	f Taxation mål arable land 1543	g Difference b - d 1100-1540	h Difference b - c 1100-1314	i Difference c - d 1314-1540	j Difference d - e	k Difference d - f
	%	%	%	%	%	%	%	%	%	%
Njurunda	13,9	8,2	9,9	12,9	10,8	-4,0	-5,7	+1,7	+3,0	+0,9
Tuna	17,4	12,2	12,0	11,3	13,8	-5,4	-5,2	-0,2	-0,7	+1,8
Selånger	14,4	8,2	10,5	9,4	11,0	-3,9	-6,2	+2,3	-1,1	+0,5
Stöde	4,5	8,2	4,5	5,4	6,3	0,0	+3,7	-3,7	+0,9	+1,8
Torp	6,0	12,2	7,1	8,5	8,8	+1,1	+6,2	-5,1	+1,4	+1,7
Borgsjö	1,0	8,2	7,3	7,8	7,6	+6,3	+7,2	-0,9	+0,5	+0,3
Skön	29,8	16,3	20,2	19,7	17,5	-9,6	-13,5	+3,9	-0,5	-2,7
Hässjö	3,0	6,1	11,5	10,3	7,8	+8,5	+3,1	+5,4	-1,2	-3,7
Ljustorp	3,5	8,2	7,1	5,7	6,3	+3,6	+4,7	-1,1	-1,4	-0,8
Indal	5,5	6,1	6,0	4,7	6,2	+0,5	+0,6	-0,1	-1,3	+0,2
Liden	1,0	6,1	3,9	4,3	3,9	+2,9	+5,1	-2,2	+0,4	0,0
Total	100	100	100	100	100	0	0	0	0	0

Fig. 28. Table of relative comparisons between certain sources for the Medieval settlement development in the province of Medelpad. Settled units c 1100 are the same as in fig. 26, and settled units c 1540 are the same as in fig. 27. Public financial sources are specified in the text.

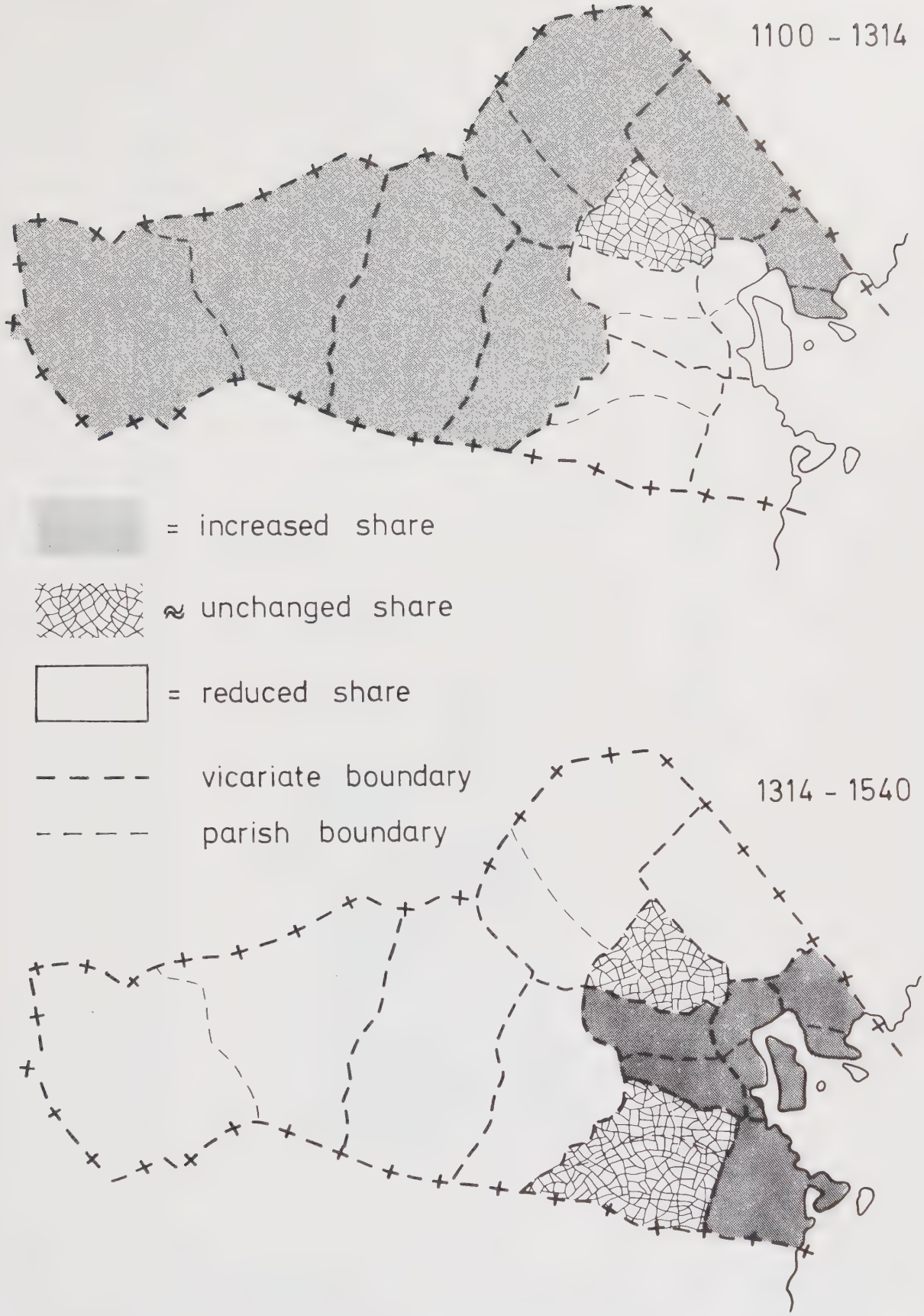


Fig. 29. Maps illustrating the development of the relative shares per vicariate, partially between the end of the Iron Age and 1314 and partially between 1314 and the 1500's, according to units with ancient monuments, the six years' tithes and the oldest tax books.

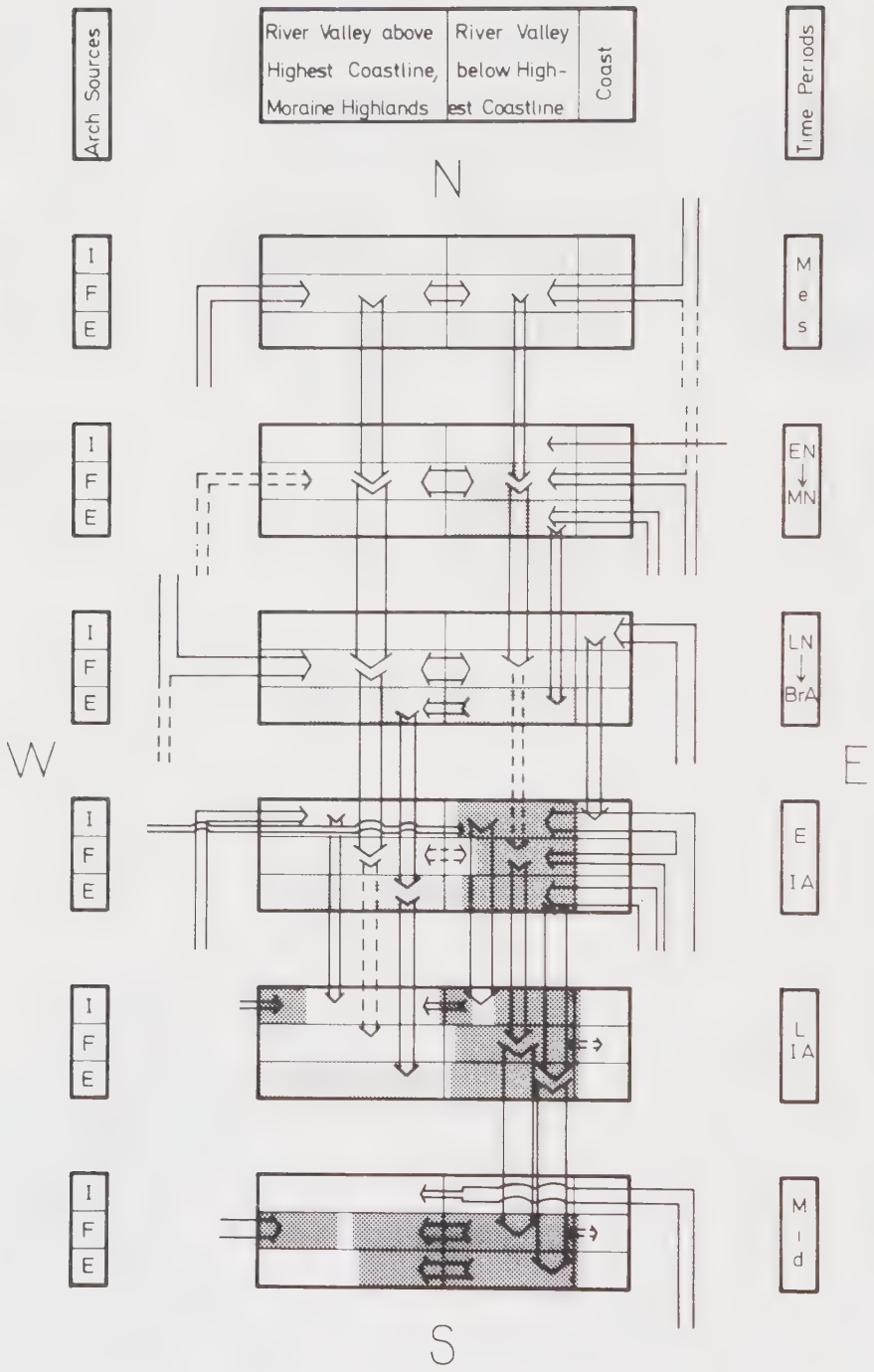
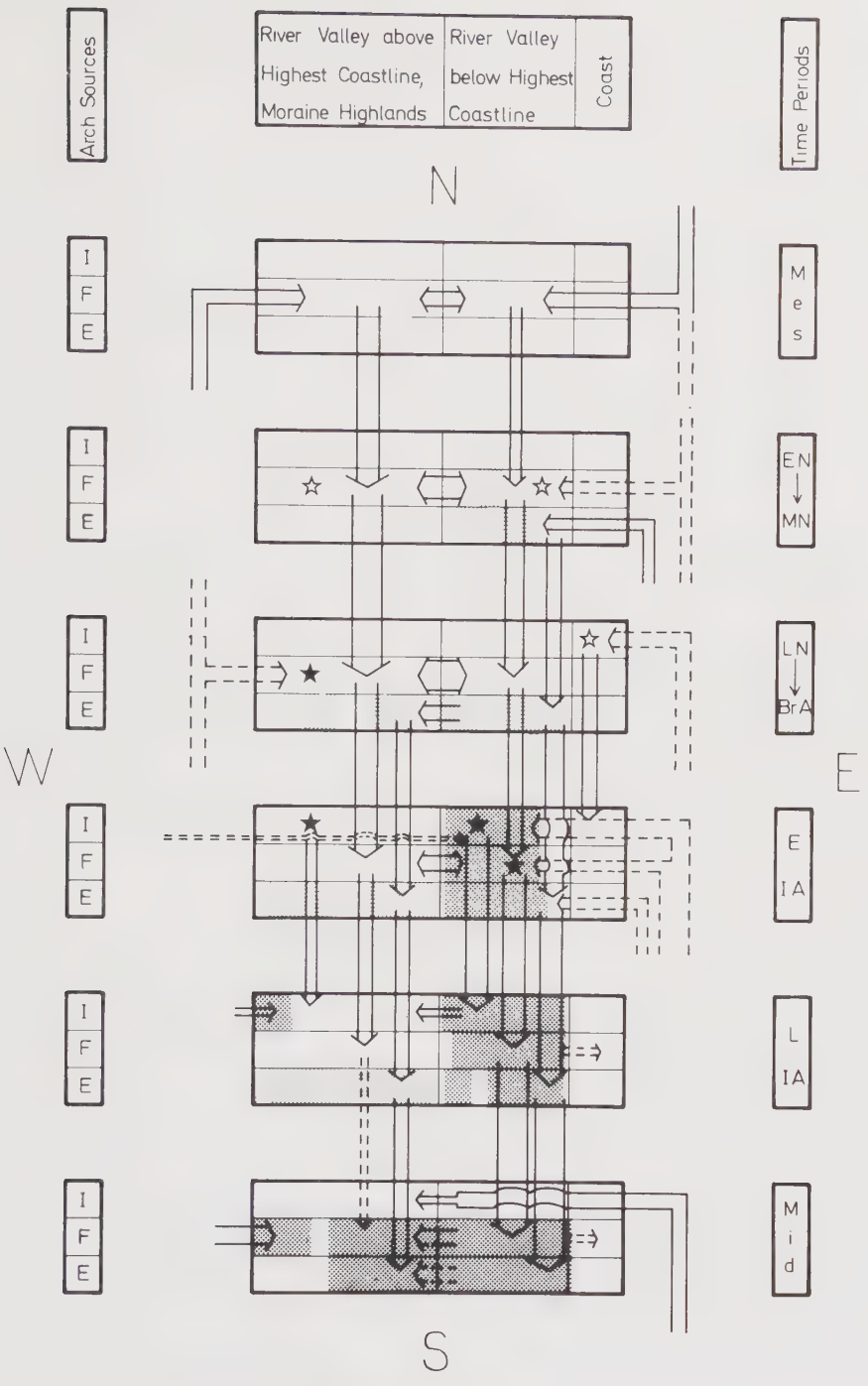


Fig. 30-31. Two models of the prehistoric and Medieval culture process in the Ljungan river basin. They are designed in the same way, but the left illustrates a cultural evolution or development in a traditionalist-diffusionist way of thinking while the right illustrates an adaptive-innovatory paradigm. The boxes are given in a chronological order and divided according to sources and human-ecological systems.
I = ideal sources, F = functional sources, E = environmental sources, Mes = Mesolithic, EN/MN = Early and Middle Neolithic, LN/Bra = Late Neolithic and Bronze Age, EIA = Early Iron Age, LIA = Late Iron Age, Mid = Middle Ages.


Arch Sources
River Valley above Highest Coastline, Moraine Highlands
River Valley below Highest Coastline
Coast
Time Periods
N
W
E
S
I F E
Mes
EN ↓ MN
LN ↓ BrA
E IA
L IA
Mid
★= Reliable internal invention
☆= Possible internal invention
= Sub-neolithic culture
= Agrarian culture
= Reliable influence/development
= Possible influence/development

SOURCES

Economic Map of Sweden, issued by National Land Survey of Sweden, sheets within the counties of Jämtland and Västernorrland.

Catalogues in JLM and SHM

Recordings of older surveys of ancient monuments, reports on investigations for water regulations and smaller documents in the parish archive, ATA

The Register of Ancient Monuments at the Central Board of National Antiquities, the counties of Jämtland and Västernorrland.

REMARKS

Swedish geographical names are in this thesis consequently not translated, when the nouns are integral parts of the words. When Swedish *sjö* (lake), *älv* (river) etc. is a part of the name no elucidation is given, which is the case, however, with other names (for instance 'Lake Havern' but 'Holmsjön').

ABBREVIATIONS

ATA	The Antiquarian Topographical Archive (at the Central Board of National Antiquities)
JBV	Selinge 1977 according to the references
JLM	The Museum of the County of Jämtland, Östersund
NTB	The research project Early Norrland (*Norrlands tidiga bebyggelse*)
Raä	The Central Board of National Antiquities (*Riksantikvarieämbetet*), Stockholm
SHM	The Museum for National Antiquities, Stockholm
SL	Sea Level

Works referred to in this book are registered in the list below, disregarding the list in JBV. In some cases Swedish works cited in JBV are included here in English editions.

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